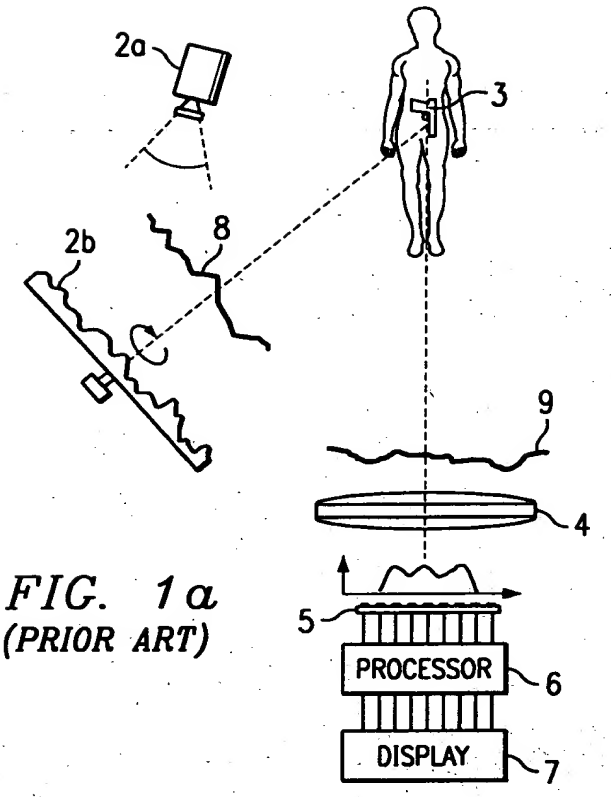


FIG. 1a
(PRIOR ART)

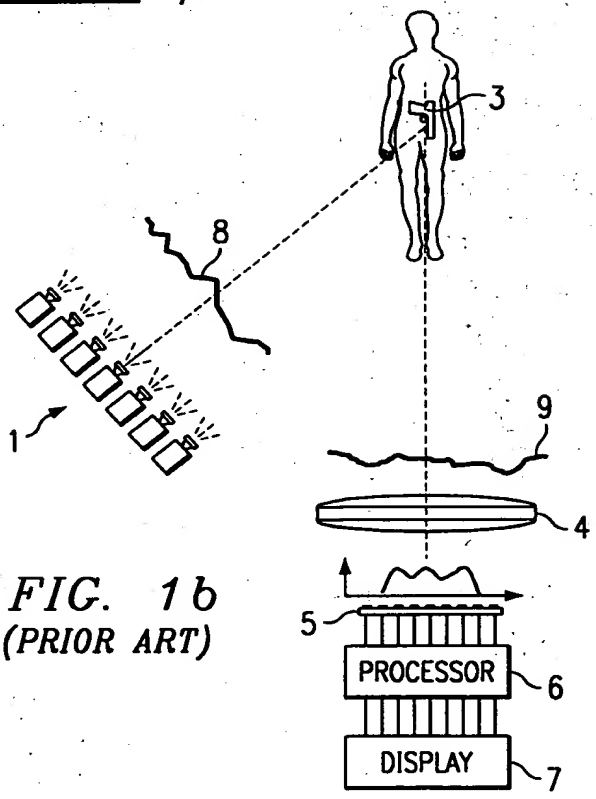


FIG. 1b
(PRIOR ART)

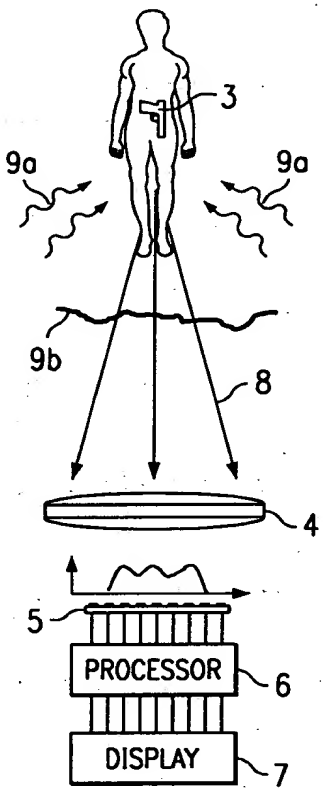


FIG. 1c
(PRIOR ART)

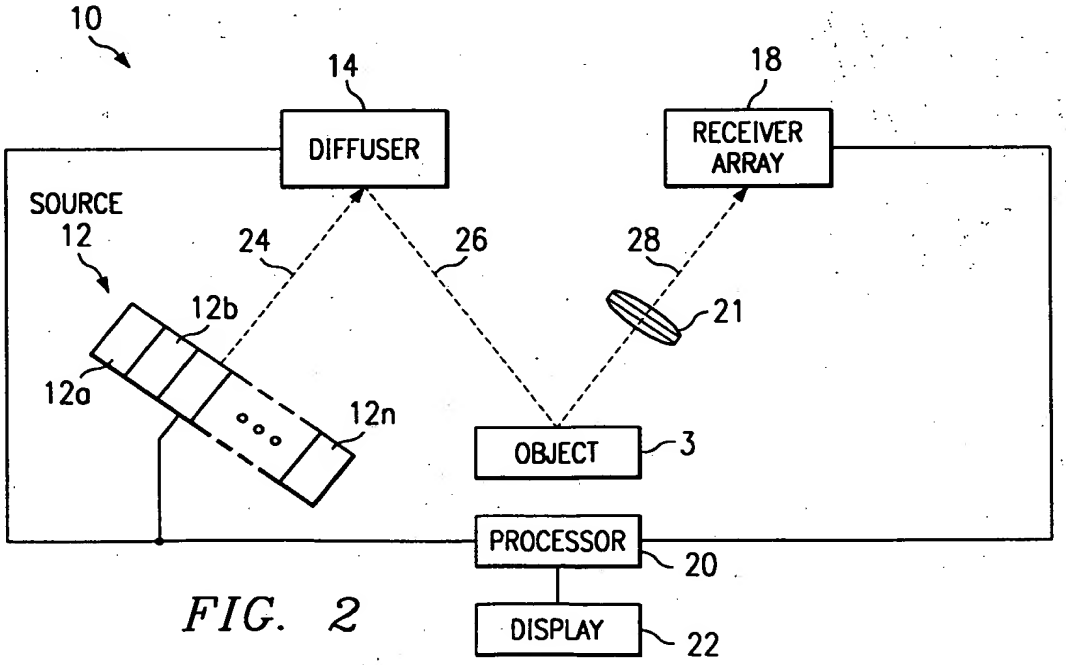


FIG. 2

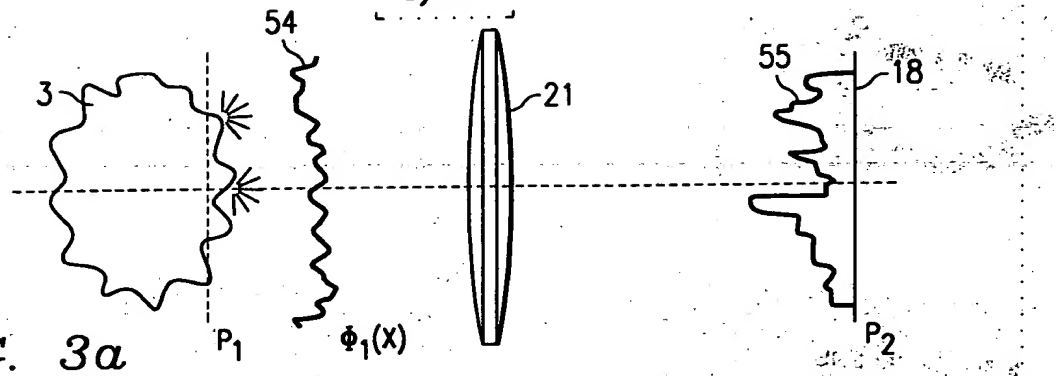


FIG. 3a

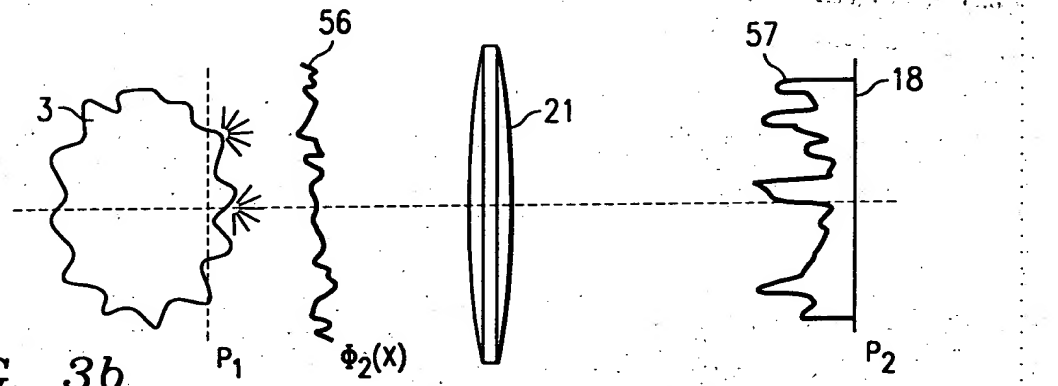


FIG. 3b

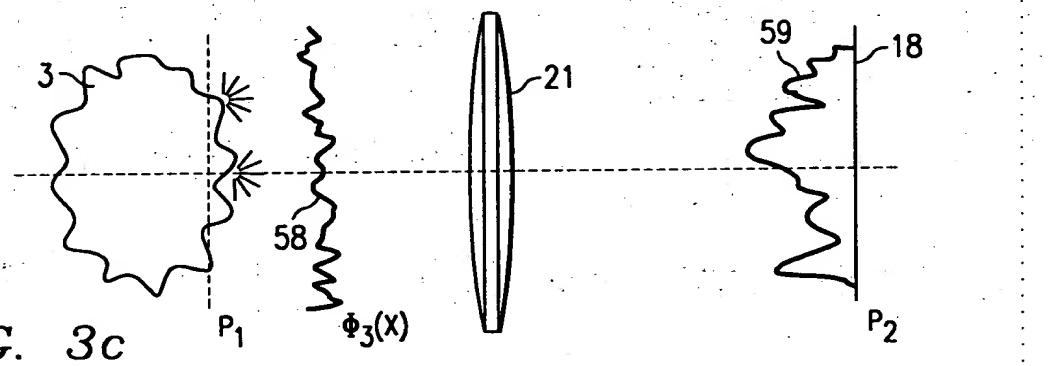


FIG. 3c

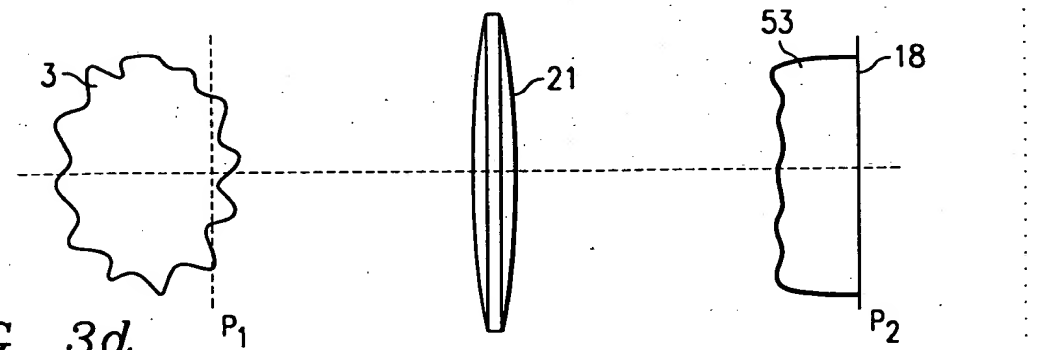


FIG. 3d

200

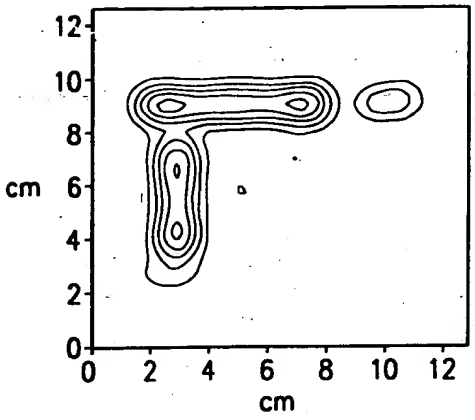


FIG. 4a

205

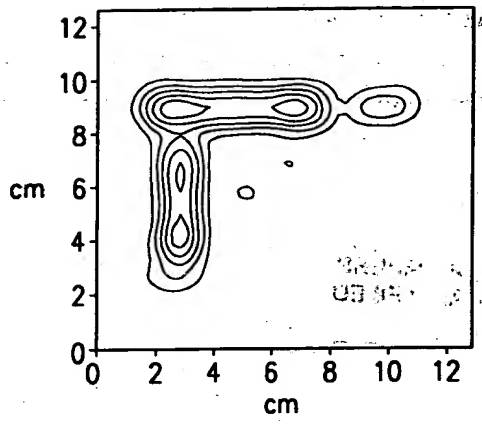


FIG. 4b

210

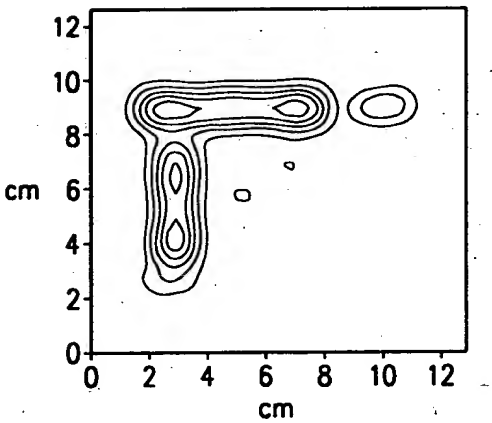


FIG. 4c

215

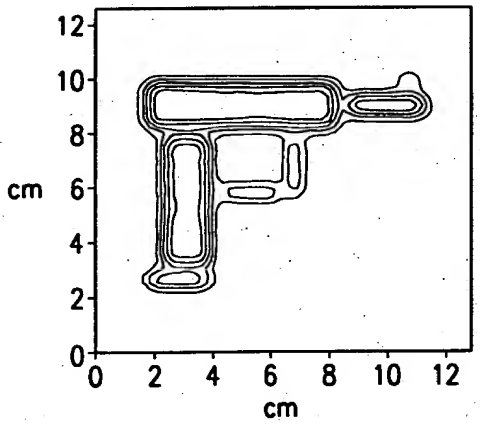


FIG. 4d

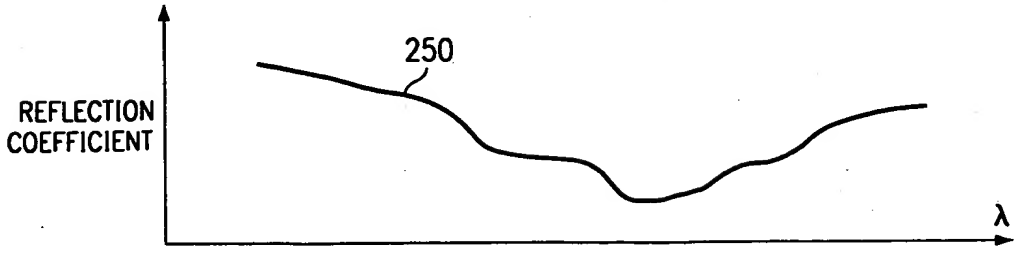


FIG. 5a

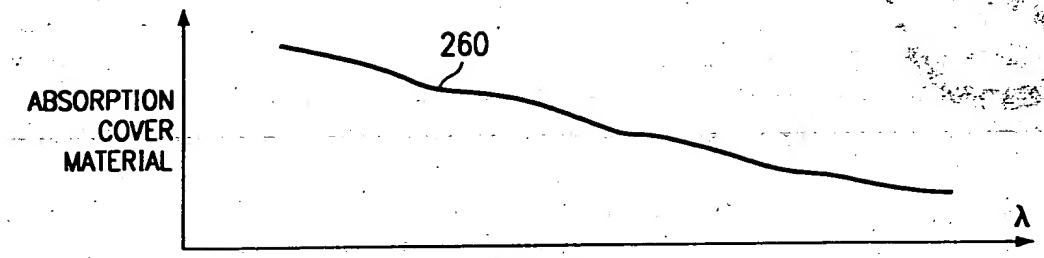


FIG. 5b

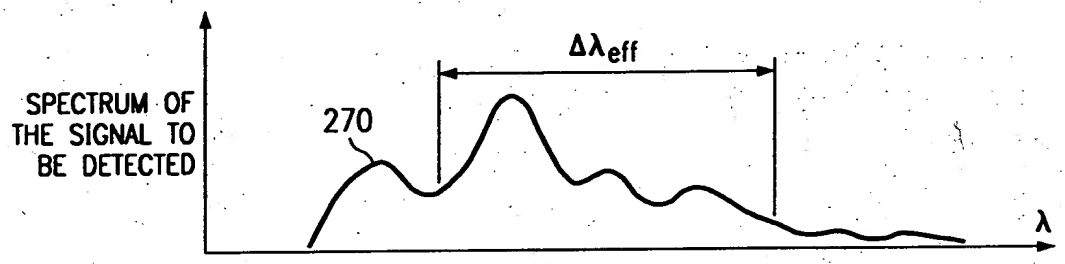


FIG. 5c

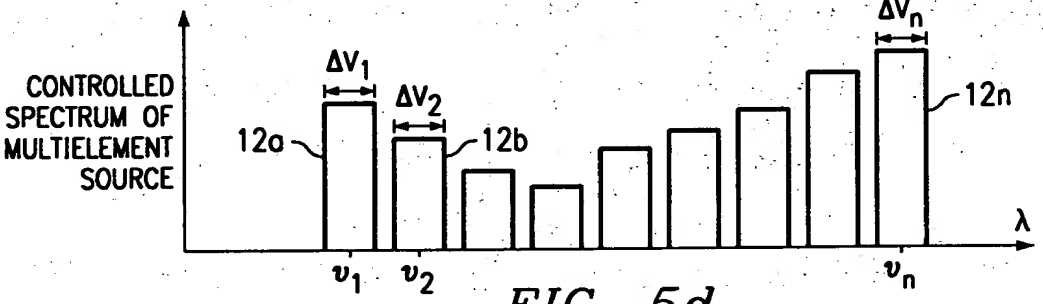


FIG. 5d

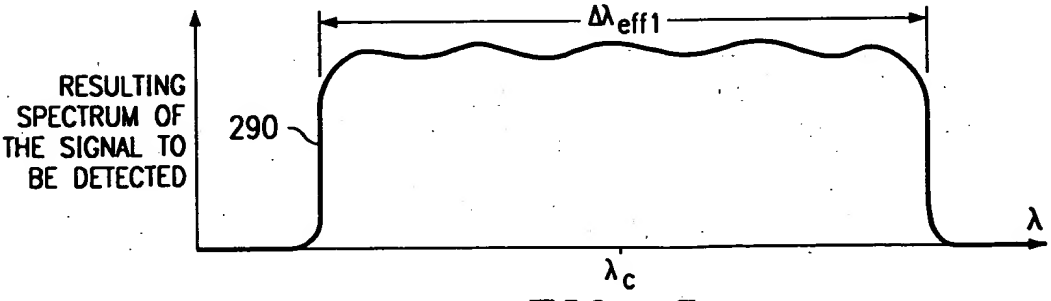


FIG. 5e

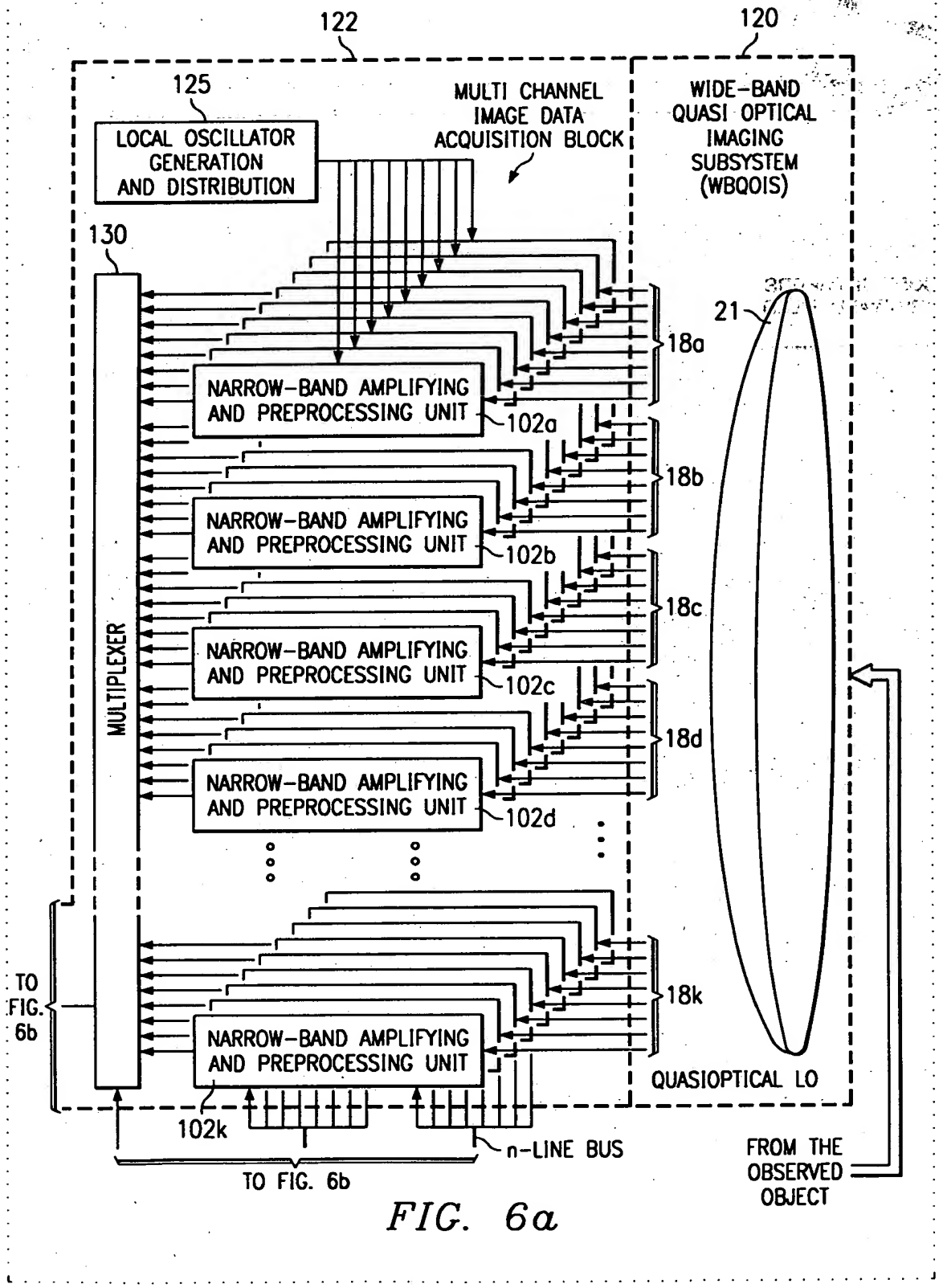

122
120
125
LOCAL OSCILLATOR GENERATION AND DISTRIBUTION
MULTI CHANNEL IMAGE DATA ACQUISITION BLOCK
WIDE-BAND QUASI OPTICAL IMAGING SUBSYSTEM (WBQOIS)
130
21
18a
NARROW-BAND AMPLIFYING AND PREPROCESSING UNIT
102a
18b
NARROW-BAND AMPLIFYING AND PREPROCESSING UNIT
102b
18c
NARROW-BAND AMPLIFYING AND PREPROCESSING UNIT
102c
18d
NARROW-BAND AMPLIFYING AND PREPROCESSING UNIT
102d
MULTIPLEXER
TO FIG. 6b
18k
NARROW-BAND AMPLIFYING AND PREPROCESSING UNIT
QUASIOPTICAL LO
102k
n-LINE BUS
TO FIG. 6b
FROM THE OBSERVED OBJECT

FIG. 6a

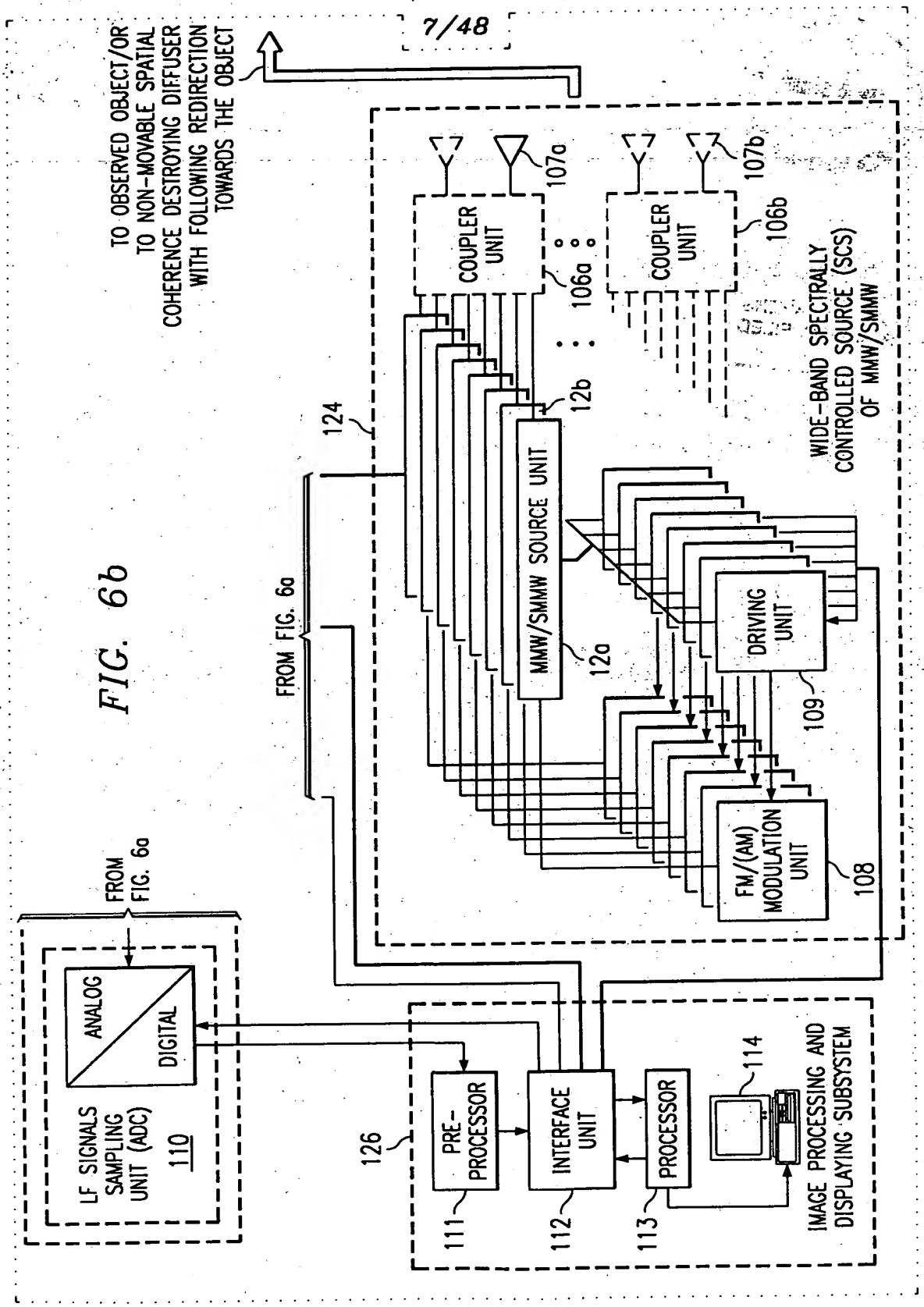

TO OBSERVED OBJECT/OR TO NON-MOVABLE SPATIAL COHERENCE DESTROYING DIFFUSER WITH FOLLOWING REDIRECTION TOWARDS THE OBJECT
FROM FIG. 6a
124
COUPLER UNIT
107a
106a
COUPLER UNIT
107b
106b
12b
MMW/SMMW SOURCE UNIT
12a
DRIVING UNIT
109
FM/(AM) MODULATION UNIT
108
WIDE-BAND SPECTRALLY CONTROLLED SOURCE (SCS) OF MMW/SMMW
FROM FIG. 6a
ANALOG
DIGITAL
LF SIGNALS SAMPLING UNIT (ADC)
110
126
PRE-PROCESSOR
111
INTERFACE UNIT
112
PROCESSOR
113
114
IMAGE PROCESSING AND DISPLAYING SUBSYSTEM

FIG. 6b

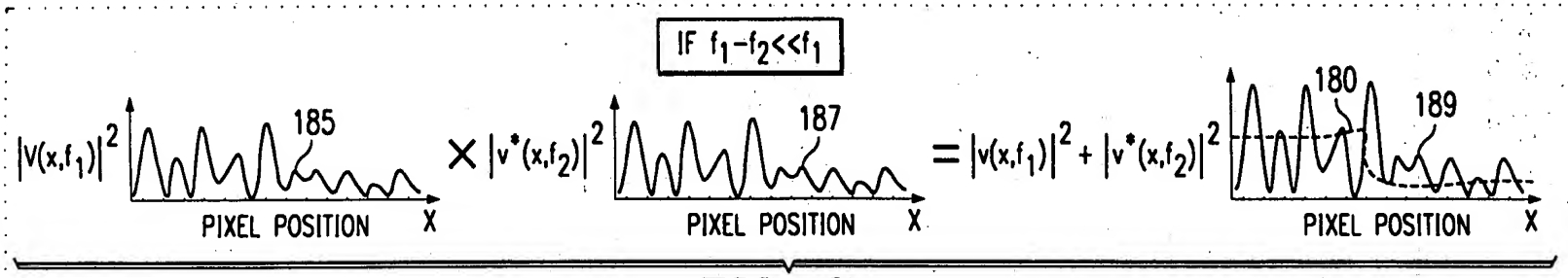


FIG. 7a

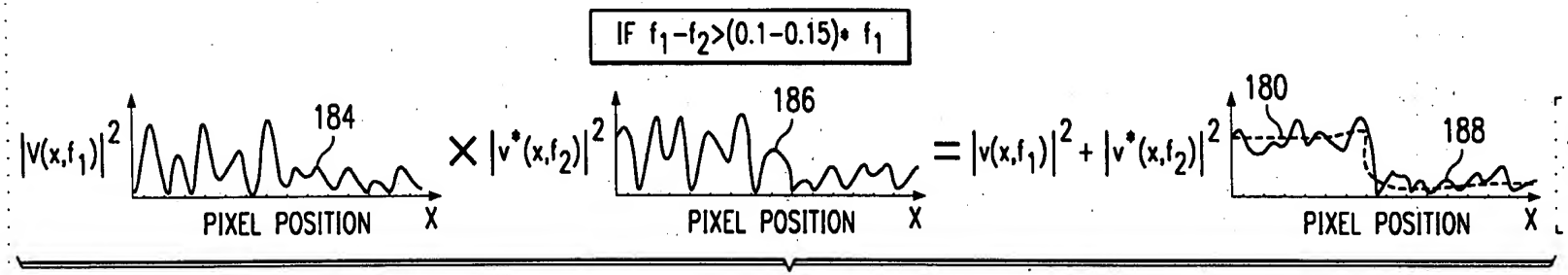


FIG. 7b

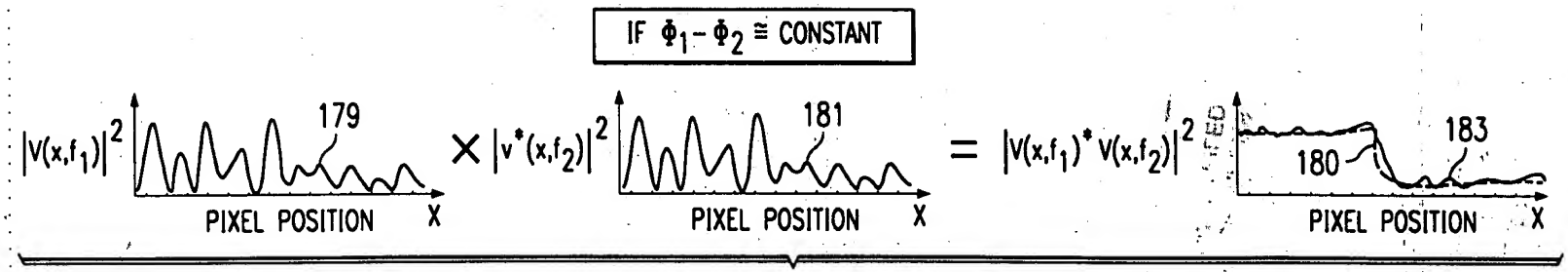


FIG. 7c

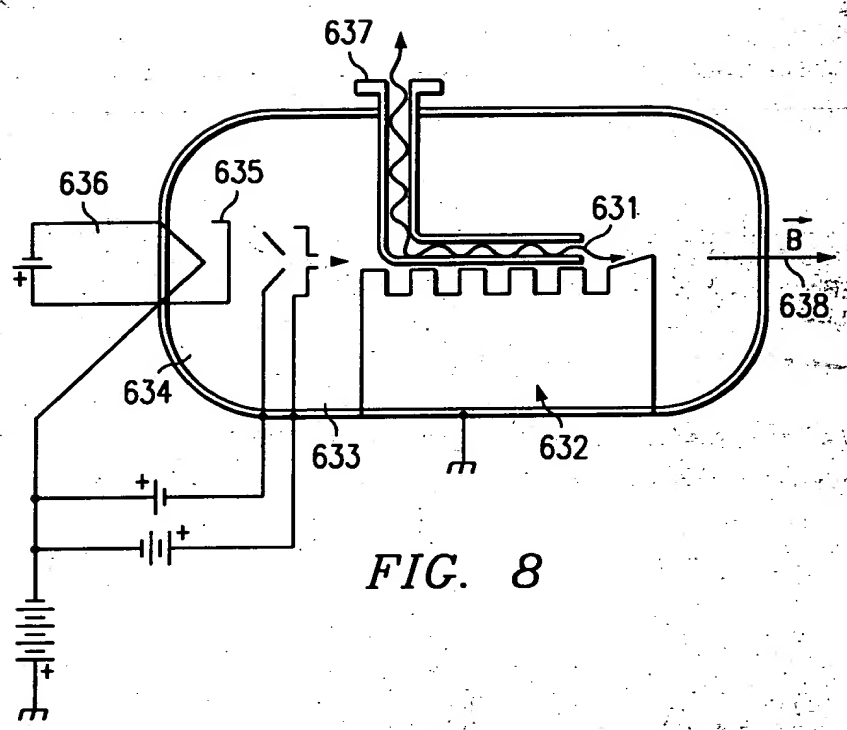


FIG. 8

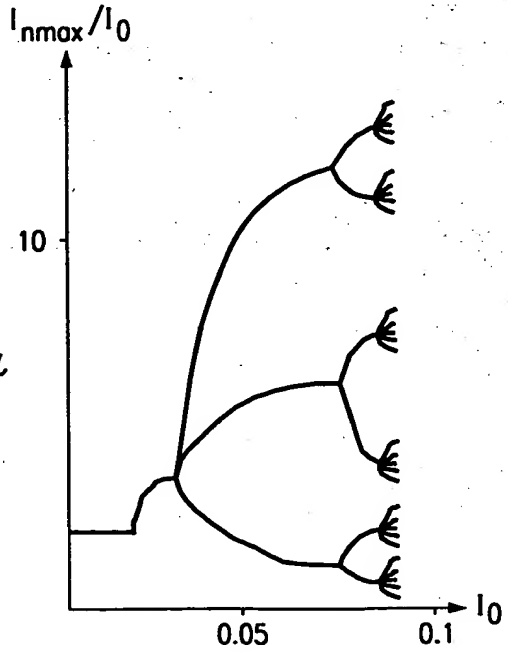


FIG. 9a

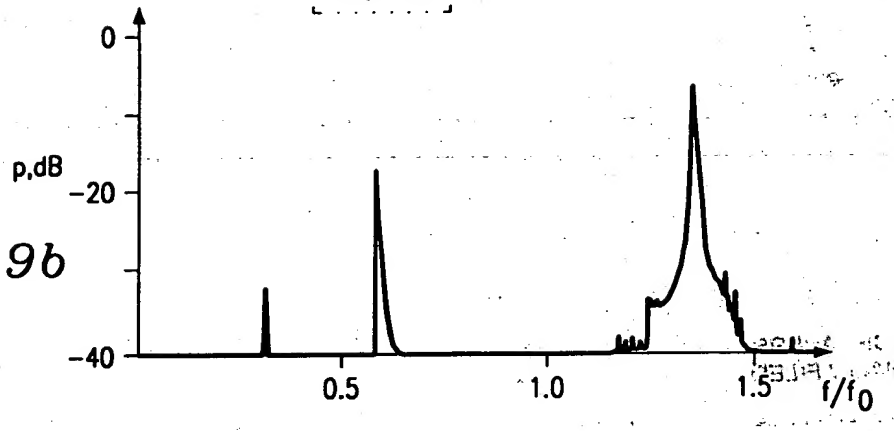


FIG. 9b

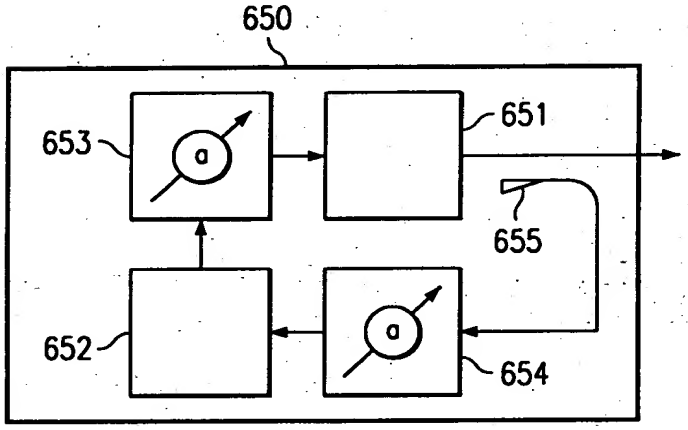


FIG. 10

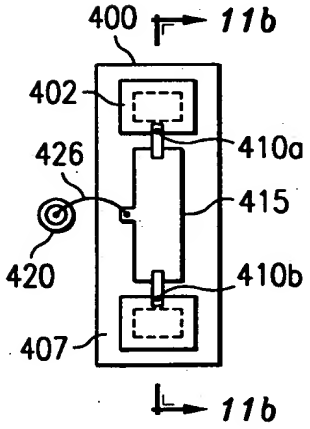


FIG. 11a

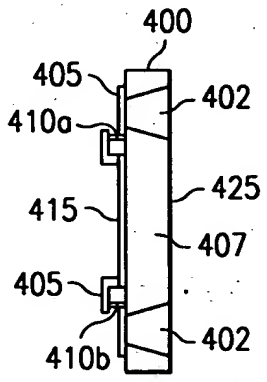


FIG. 11b

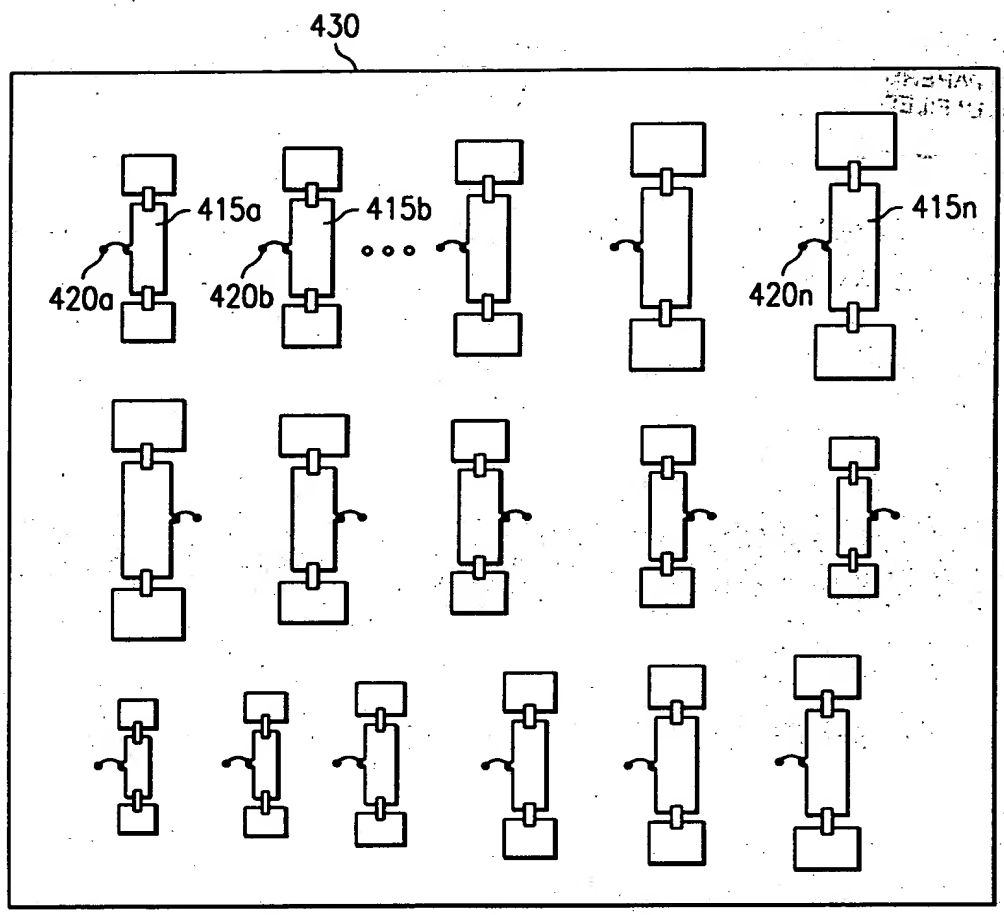


FIG. 11c

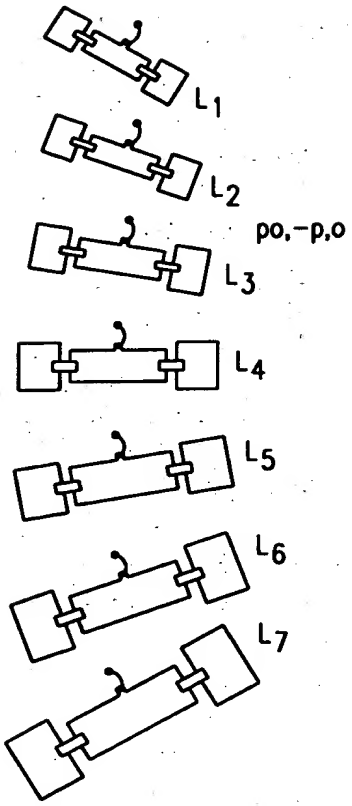


FIG. 12a

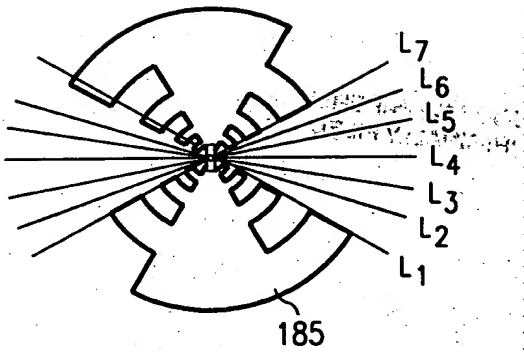


FIG. 12b

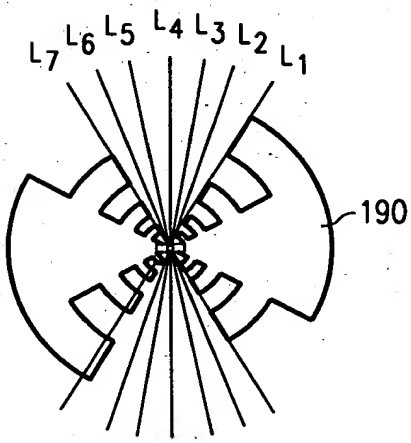


FIG. 12c

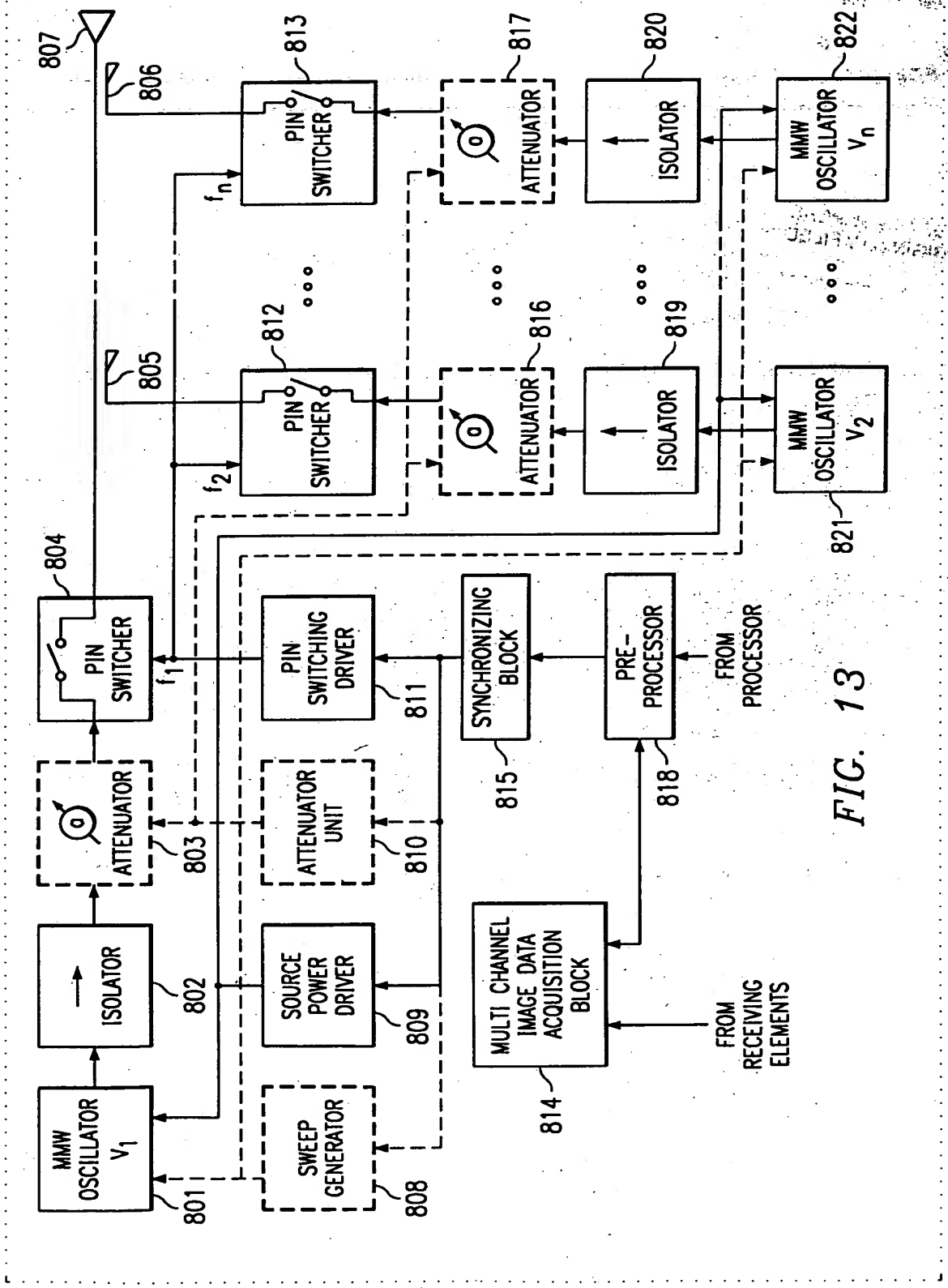

MMW OSCILLATOR V_1
801
ISOLATOR
802
ATTENUATOR
803
PIN SWITCHER
804
807
806
805
PIN SWITCHER
812
PIN SWITCHER
813
f_1
f_2
f_n
SWEEP GENERATOR
808
SOURCE POWER DRIVER
809
ATTENUATOR UNIT
810
PIN SWITCHING DRIVER
811
MULTI CHANNEL IMAGE DATA ACQUISITION BLOCK
814
SYNCHRONIZING BLOCK
815
ATTENUATOR
816
ATTENUATOR
817
PRE-PROCESSOR
818
FROM PROCESSOR
FROM RECEIVING ELEMENTS
ISOLATOR
819
ISOLATOR
820
MMW OSCILLATOR V_2
821
MMW OSCILLATOR V_n
822

FIG. 13

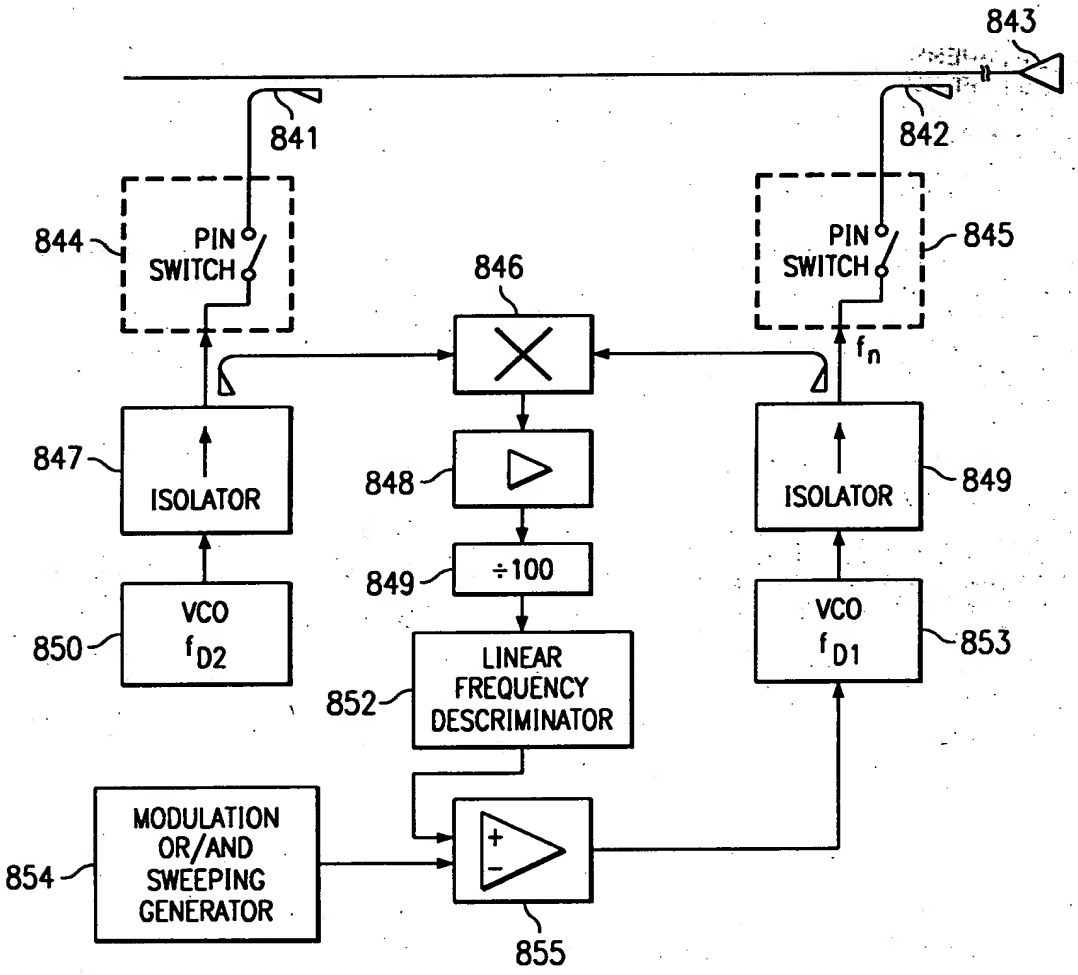

843
841
842
844
PIN SWITCH
845
PIN SWITCH
846
f_n
847
ISOLATOR
848
849
ISOLATOR
849
÷100
850
VCO f_{D2}
LINEAR FREQUENCY DESCRIMINATOR
852
VCO f_{D1}
853
MODULATION OR/AND SWEEPING GENERATOR
854
+
−
855

FIG. 14a

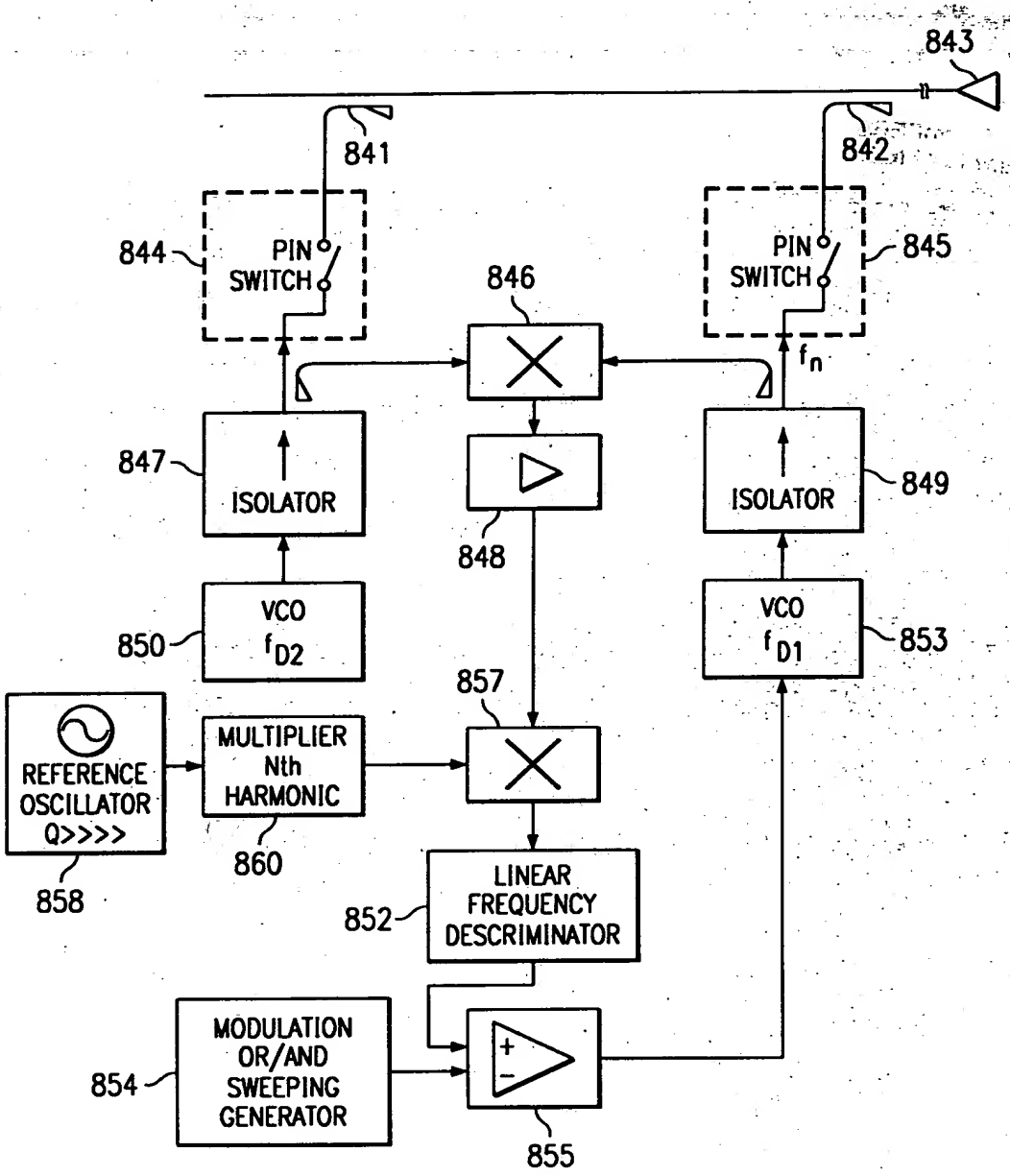

843
841
842
844
PIN SWITCH
845
PIN SWITCH
846
f_n
847
ISOLATOR
848
ISOLATOR
849
850
VCO f_{D2}
VCO f_{D1}
853
857
REFERENCE OSCILLATOR Q>>>>
MULTIPLIER Nth HARMONIC
858
860
852
LINEAR FREQUENCY DESCRIMINATOR
MODULATION OR/AND SWEEPING GENERATOR
854
855

FIG. 14b

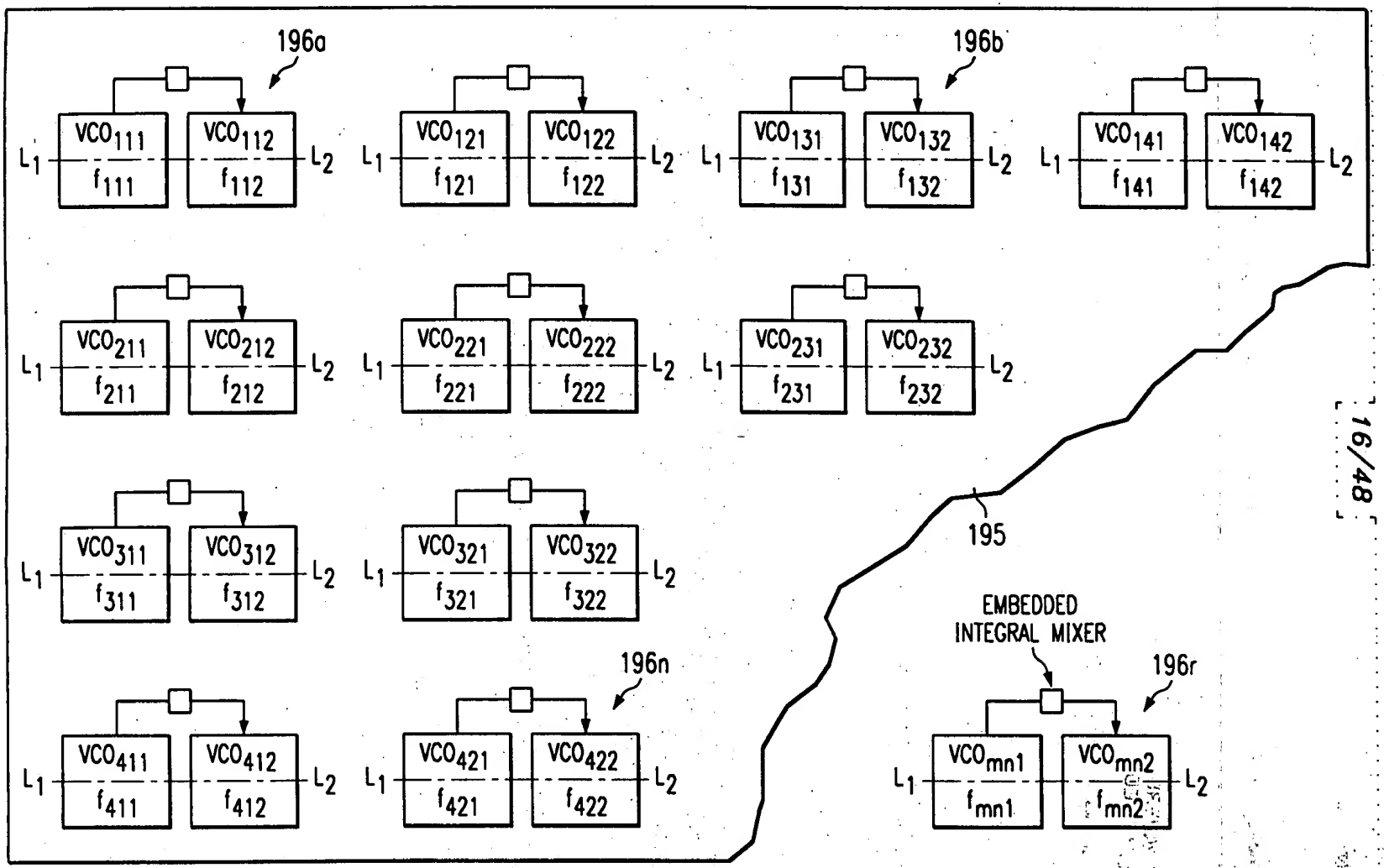

196a
196b
196n
196r
EMBEDDED
INTEGRAL MIXER
195
VCO111
VCO112
VCO121
VCO122
VCO131
VCO132
VCO141
VCO142
VCO211
VCO212
VCO221
VCO222
VCO231
VCO232
VCO311
VCO312
VCO321
VCO322
VCO411
VCO412
VCO421
VCO422
VCOmn1
VCOmn2
L1
L2

FIG. 15

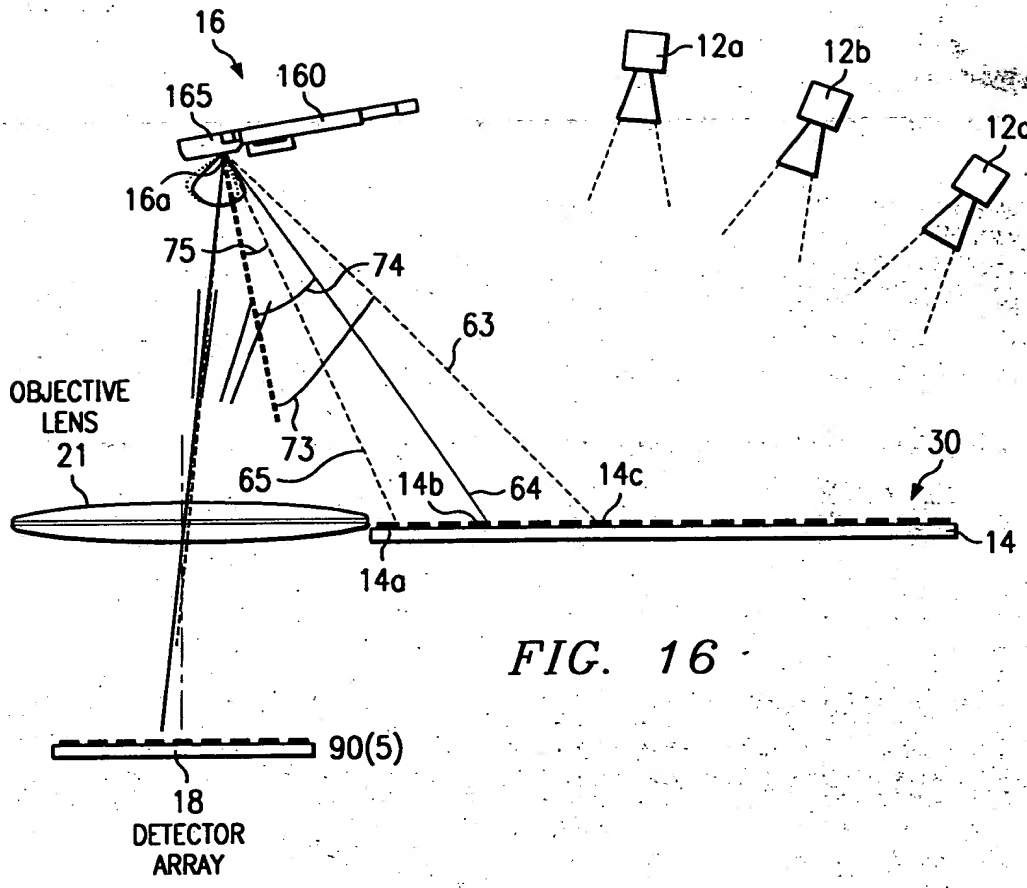


FIG. 16

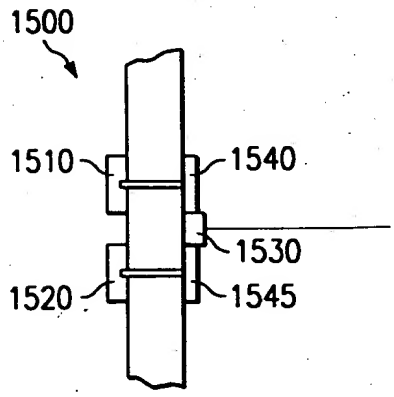


FIG. 17a

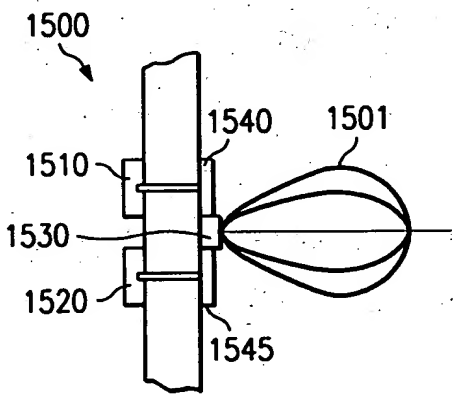


FIG. 17b

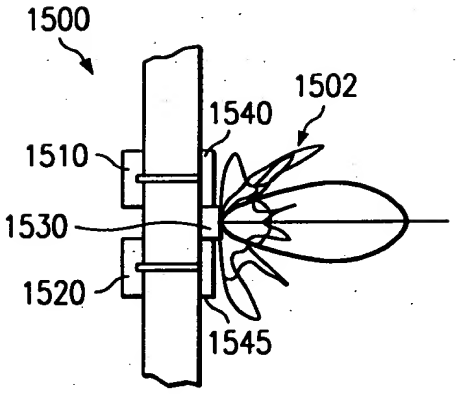


FIG. 17c

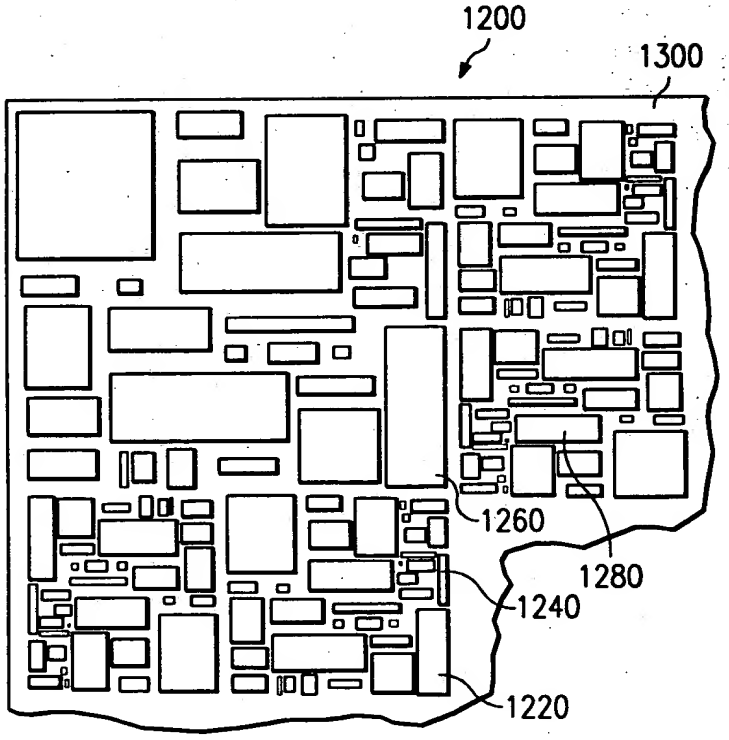


FIG. 18a

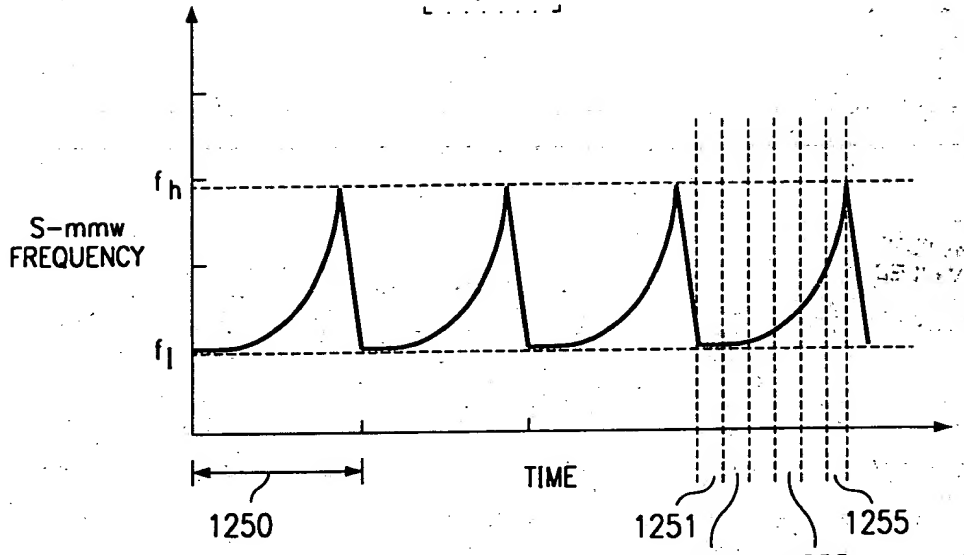


FIG. 18b

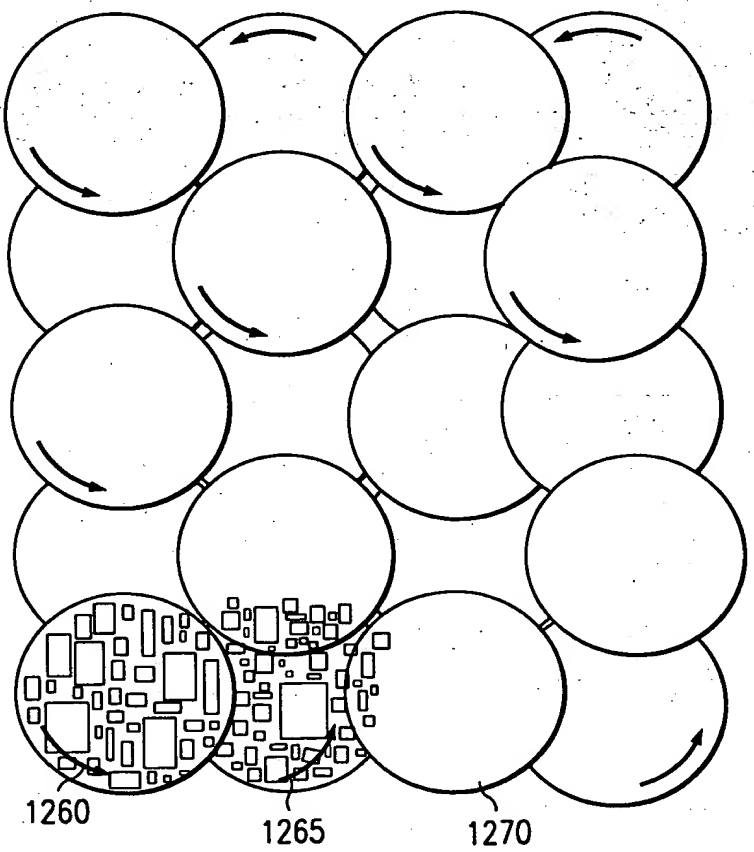


FIG. 19a

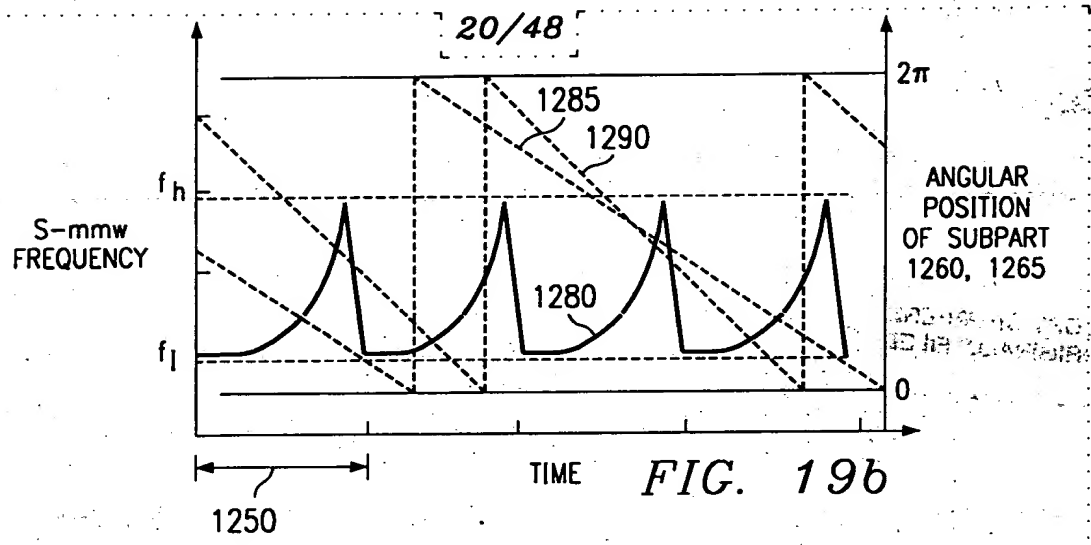


FIG. 19b

FIG. 20a

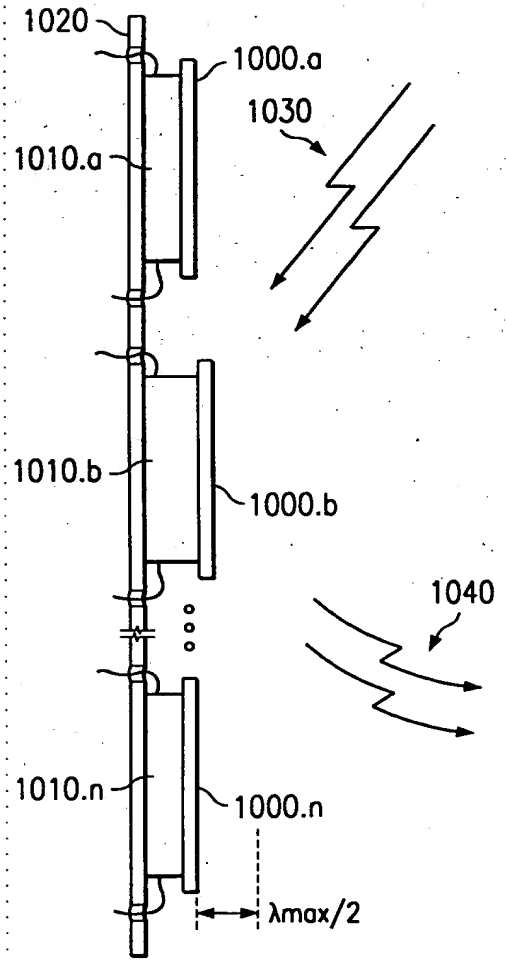
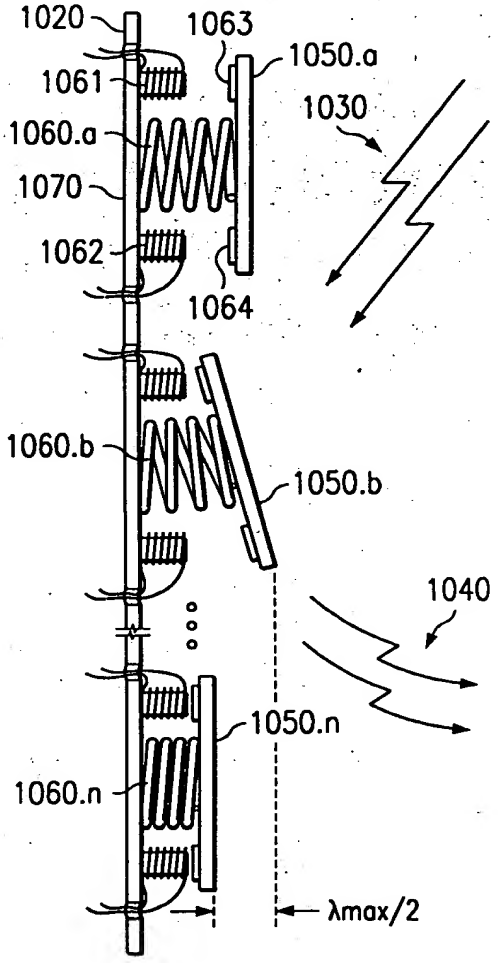


FIG. 20b



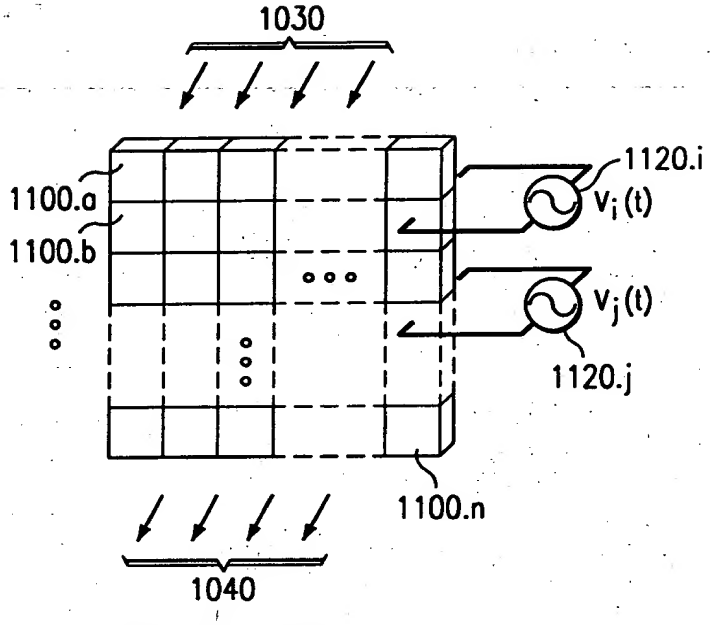


FIG. 21

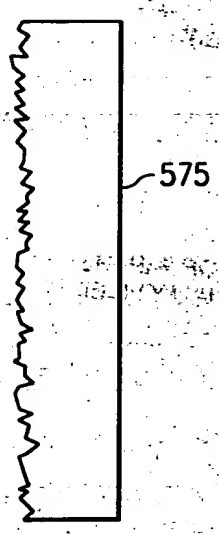


FIG. 22
(PRIOR ART)

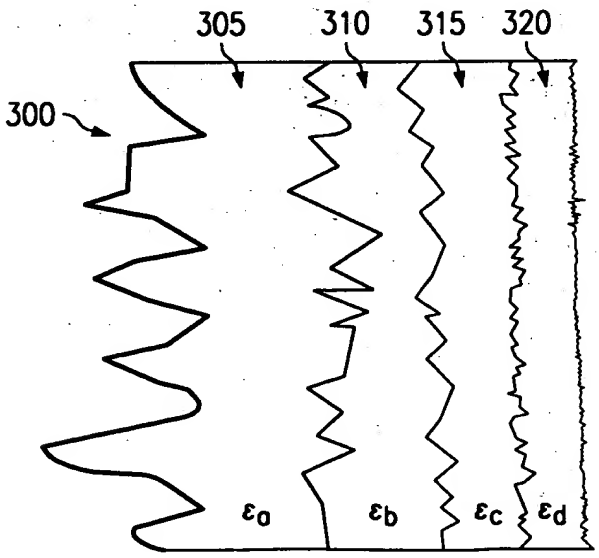


FIG. 23a

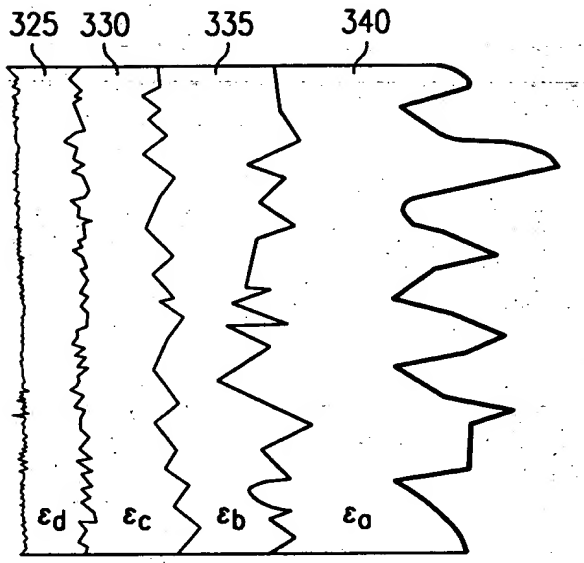


FIG. 23b

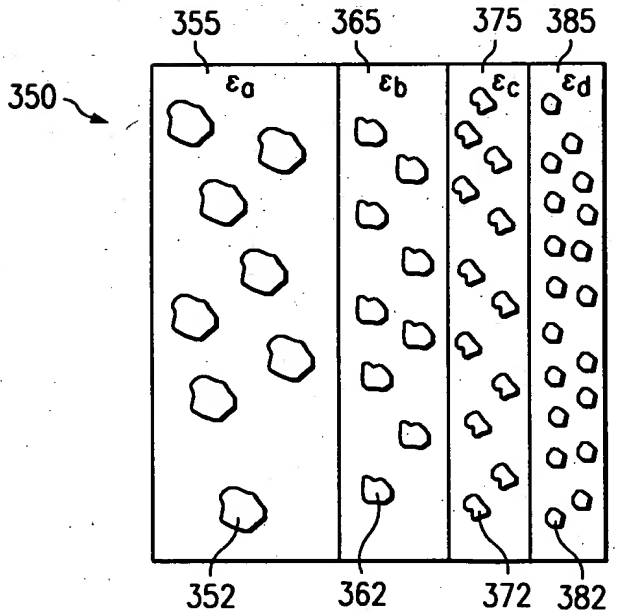


FIG. 24

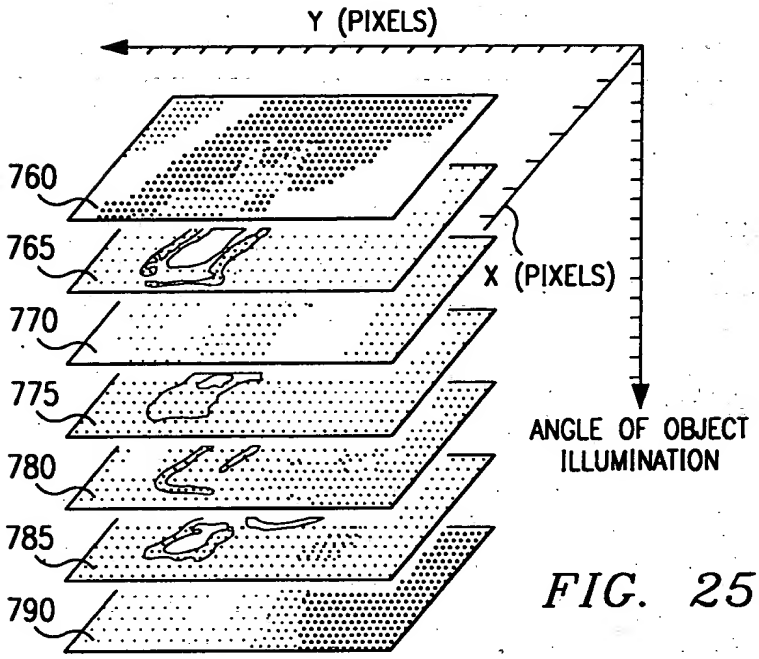


FIG. 25a

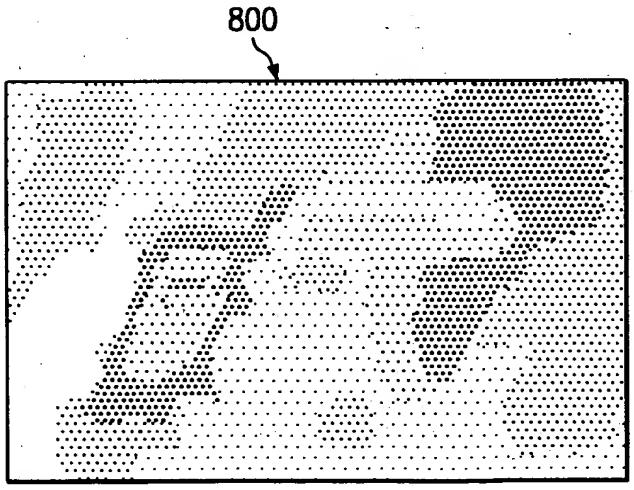


FIG. 25b

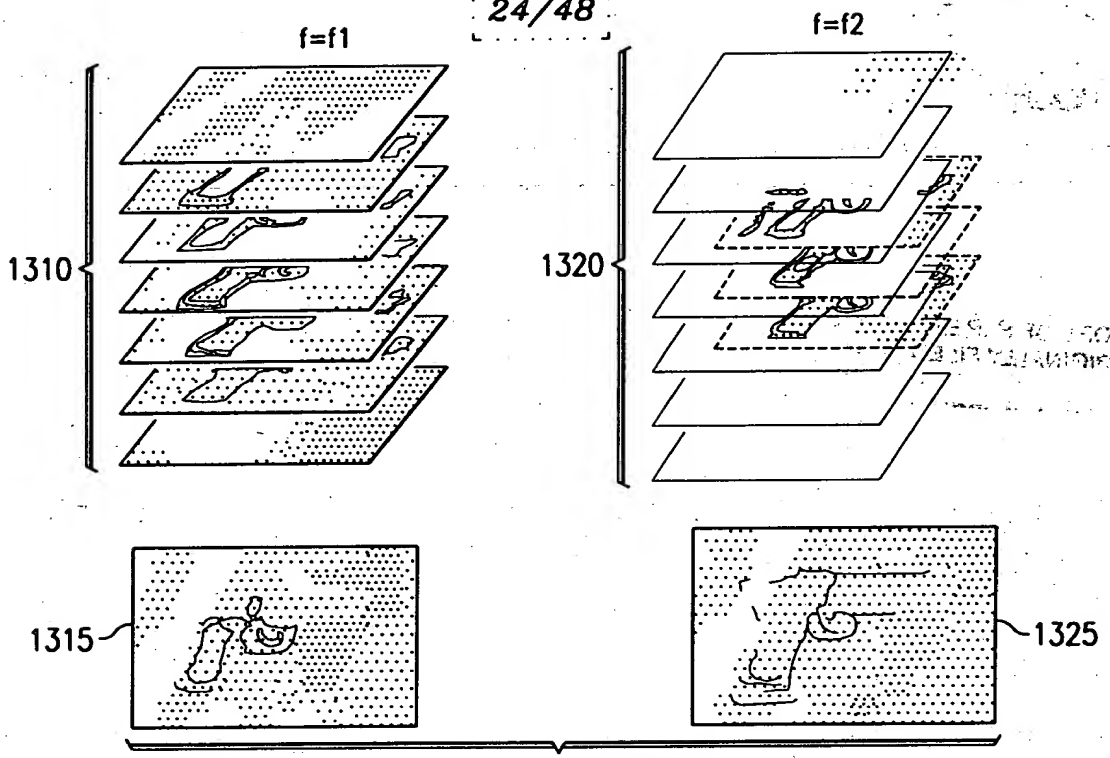


FIG. 26

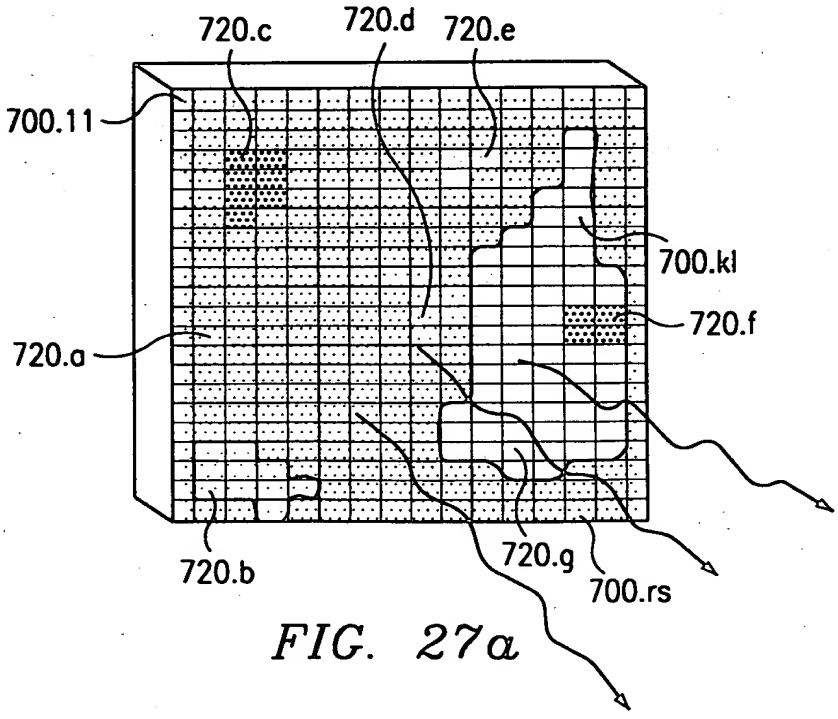


FIG. 27a

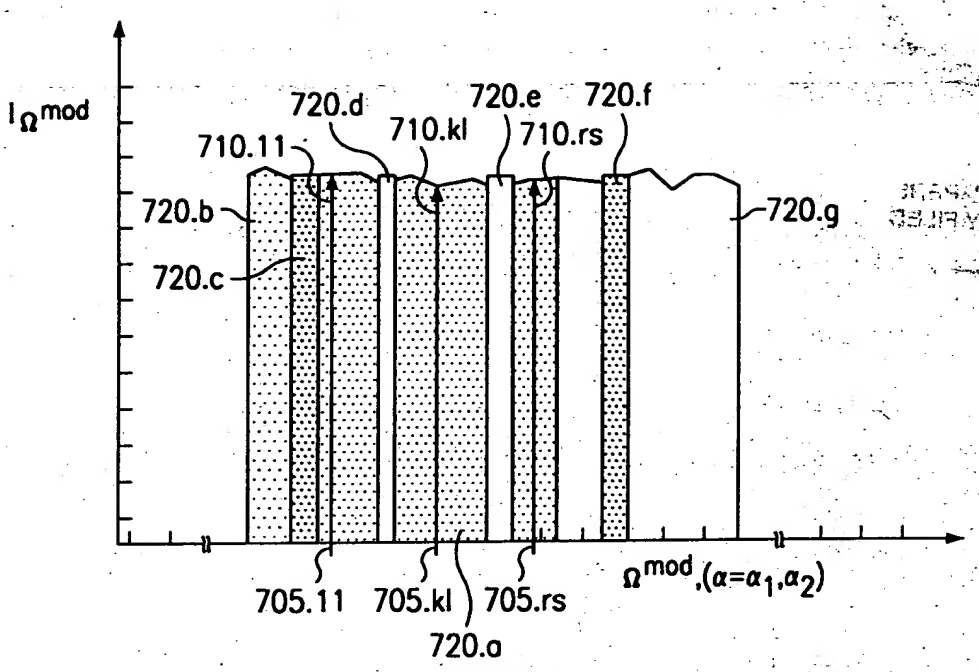


FIG. 27b

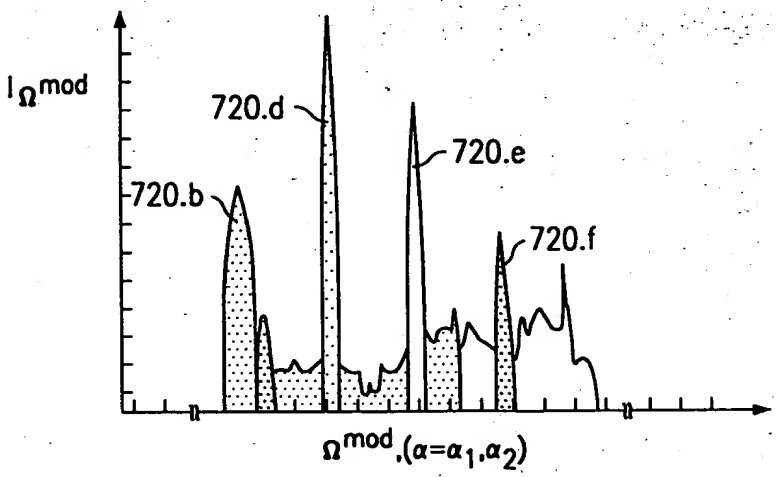


FIG. 27c

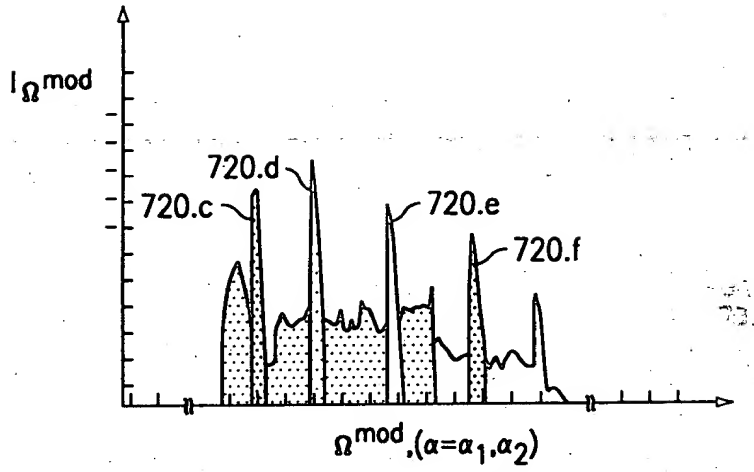


FIG. 27d

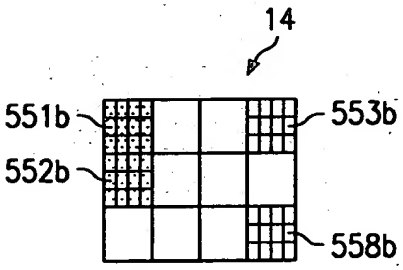


FIG. 28a

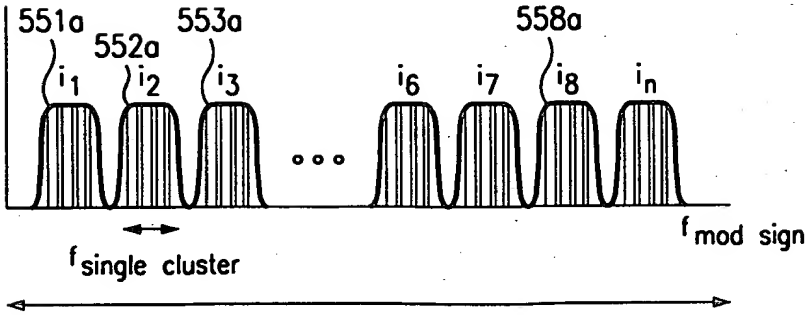


FIG. 28b

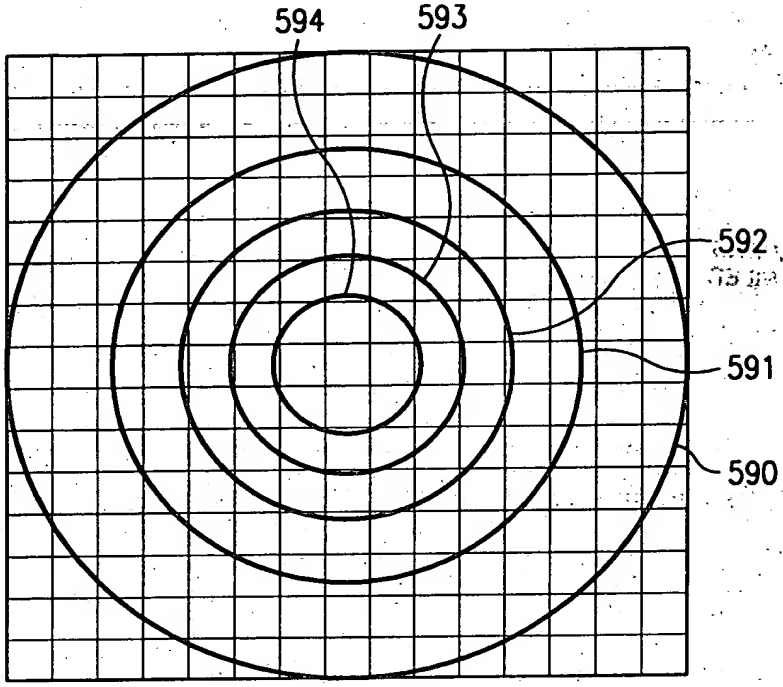

594
593
592
591
590

FIG. 29

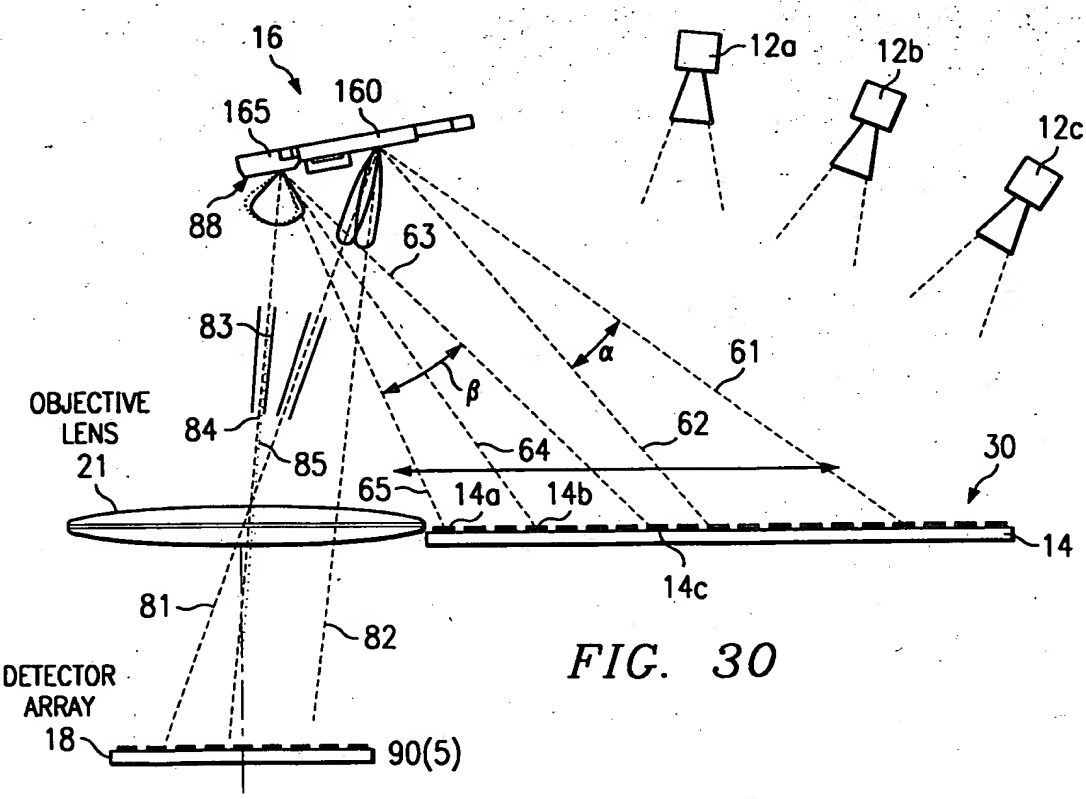

16
160
165
88
63
12a
12b
12c
83
α
61
β
OBJECTIVE LENS
21
84
85
64
62
30
65
14a
14b
14
14c
81
82
DETECTOR ARRAY
18
90(5)

FIG. 30

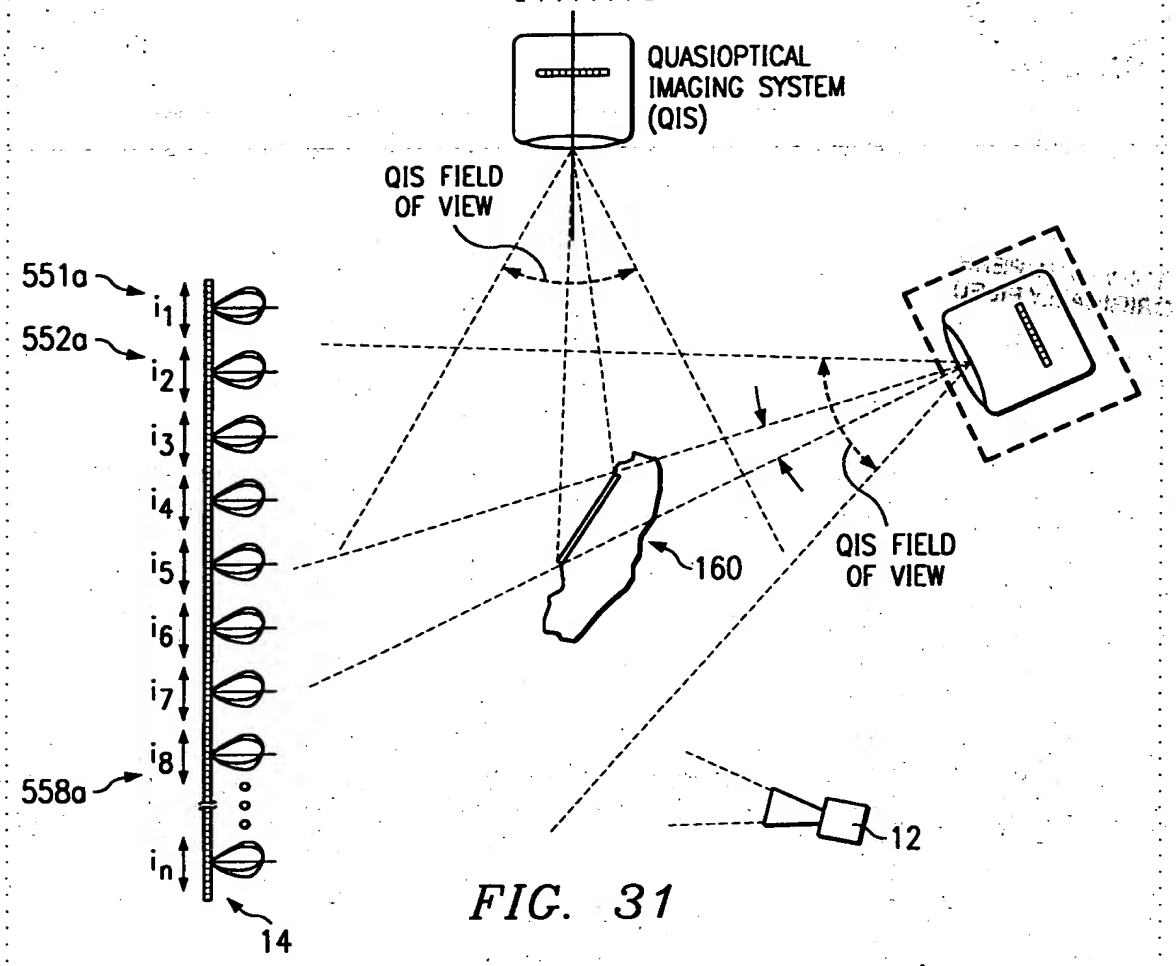

QUASIOPTICAL IMAGING SYSTEM (QIS)
QIS FIELD OF VIEW
551a
552a
558a
i_1
i_2
i_3
i_4
i_5
i_6
i_7
i_8
i_n
14
160
QIS FIELD OF VIEW
12

FIG. 31

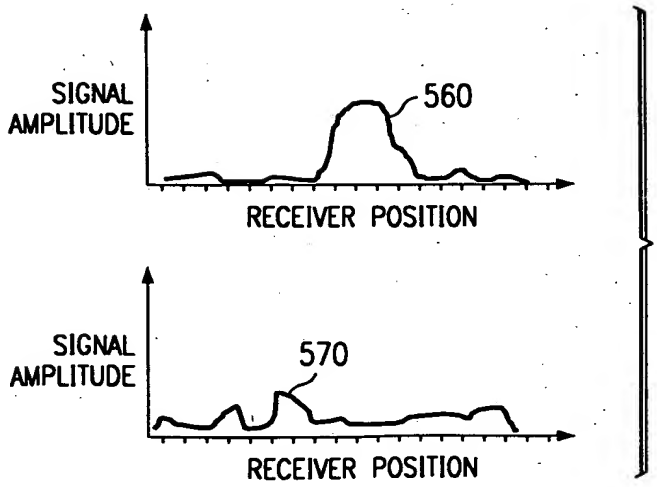

SIGNAL AMPLITUDE
560
RECEIVER POSITION
SIGNAL AMPLITUDE
570
RECEIVER POSITION

FIG. 32

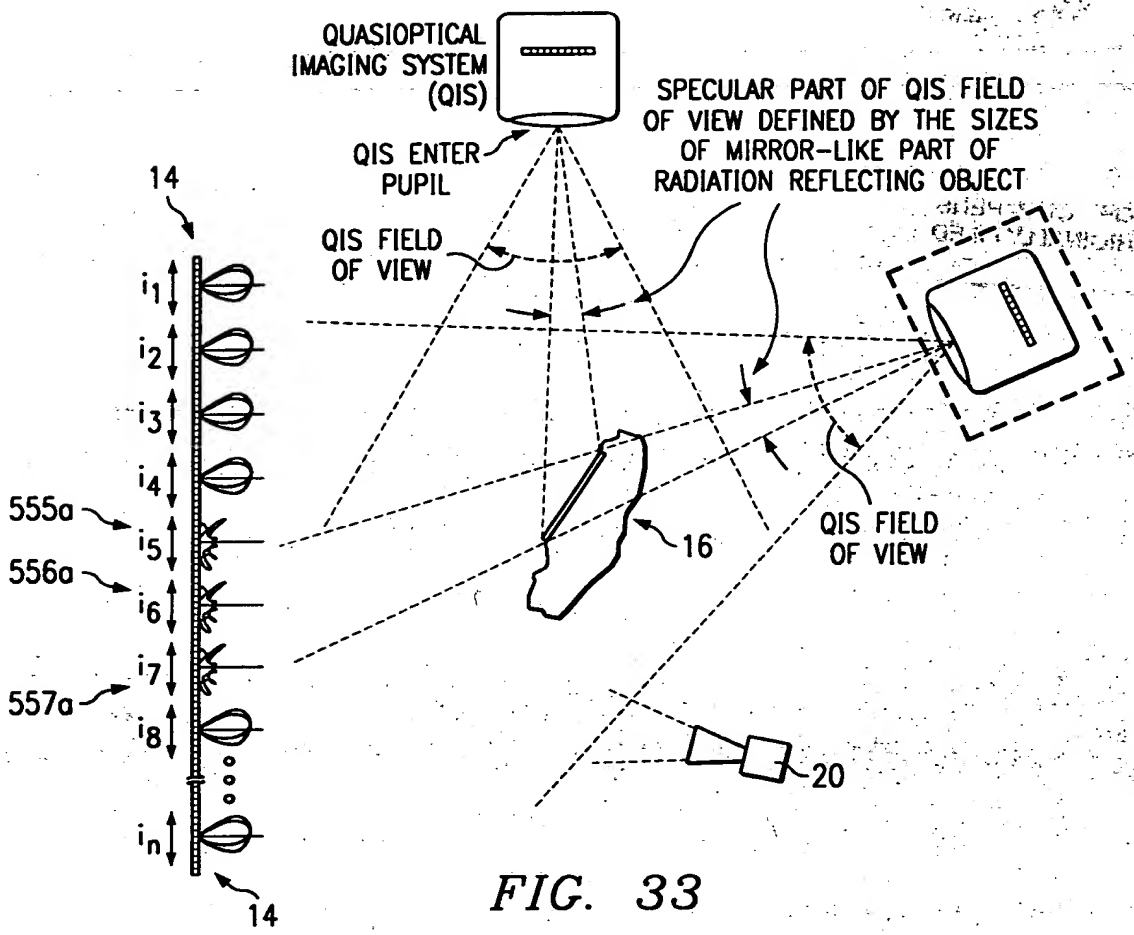


FIG. 33

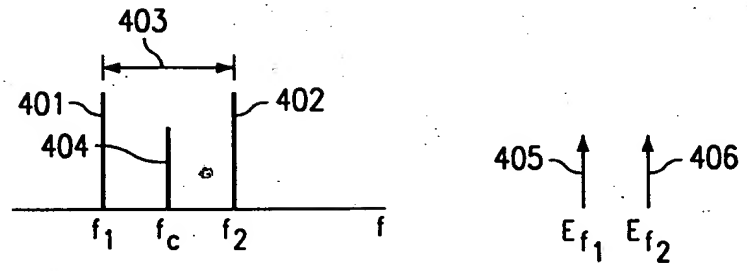
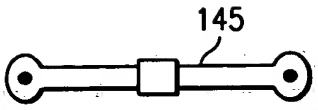
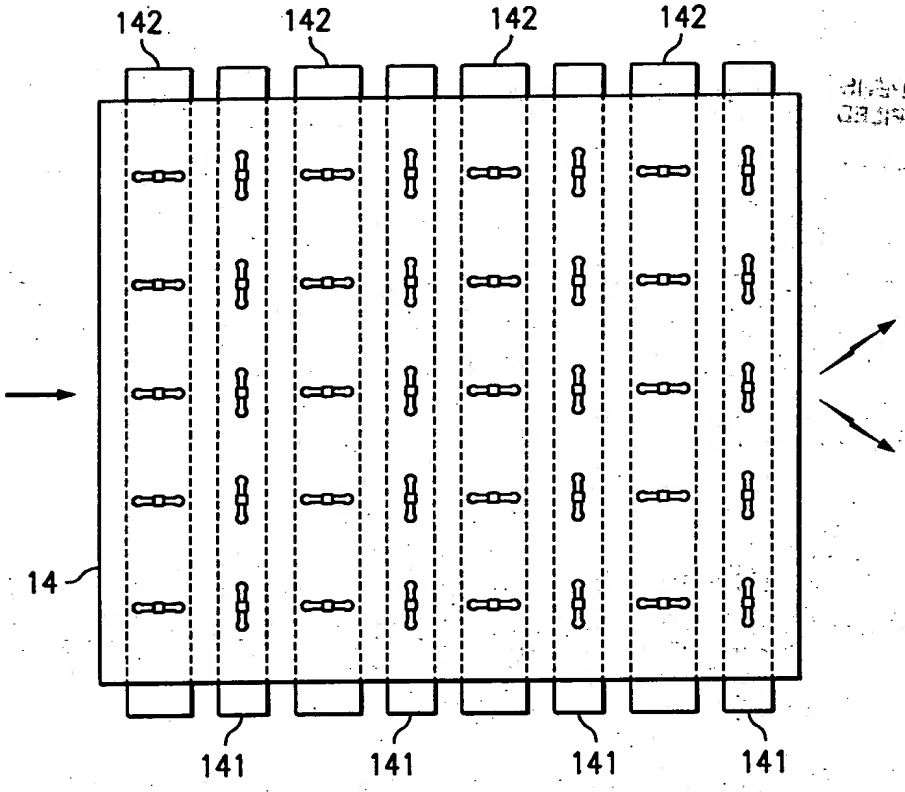


FIG. 36a

FIG. 34





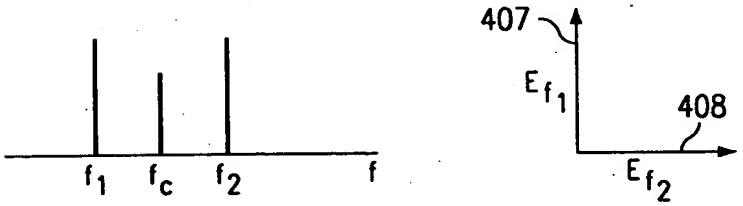


FIG. 36b

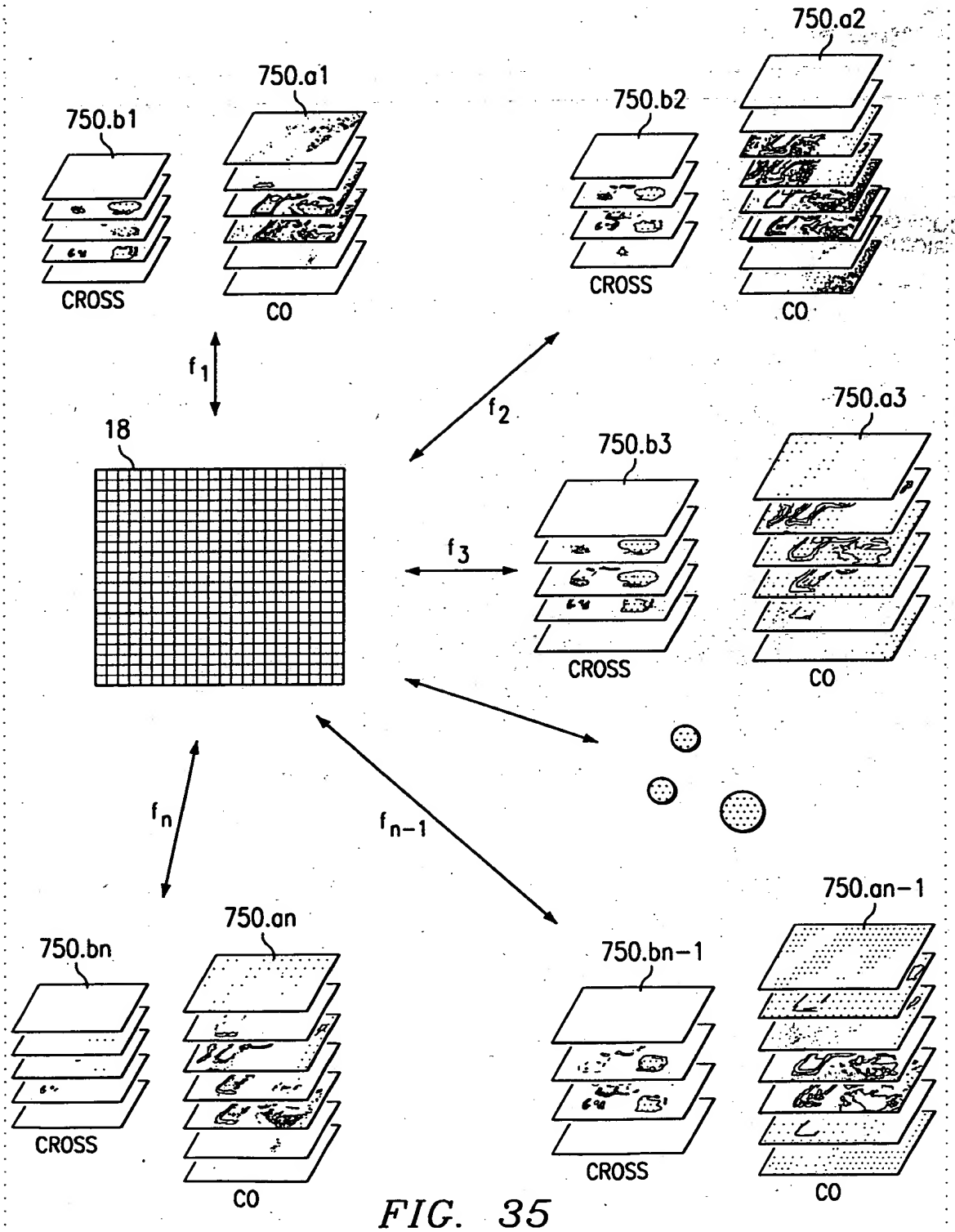

750.a2
750.a1
750.b1
750.b2
CROSS
CO
CROSS
CO
f_1
f_2
18
750.a3
750.b3
f_3
CROSS
CO
f_n
f_{n-1}
750.an-1
750.an
750.bn
750.bn-1
CROSS
CO
CROSS
CO

FIG. 35

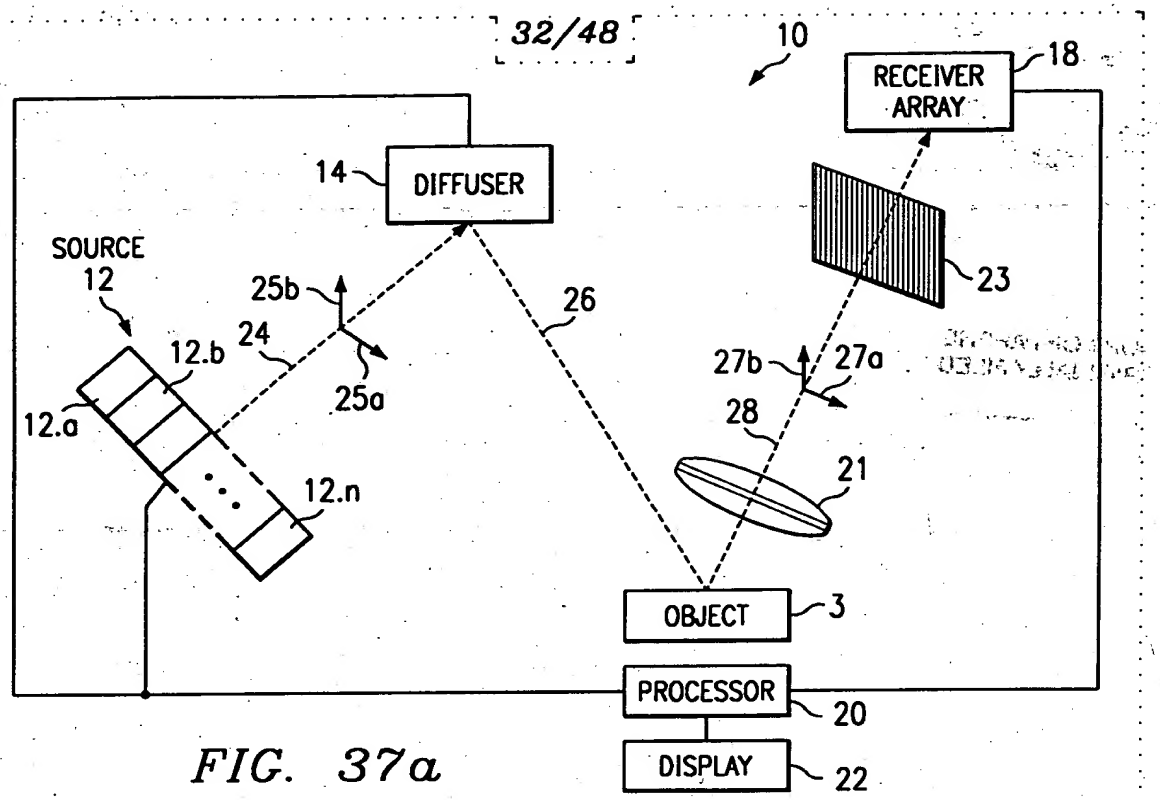


FIG. 37a

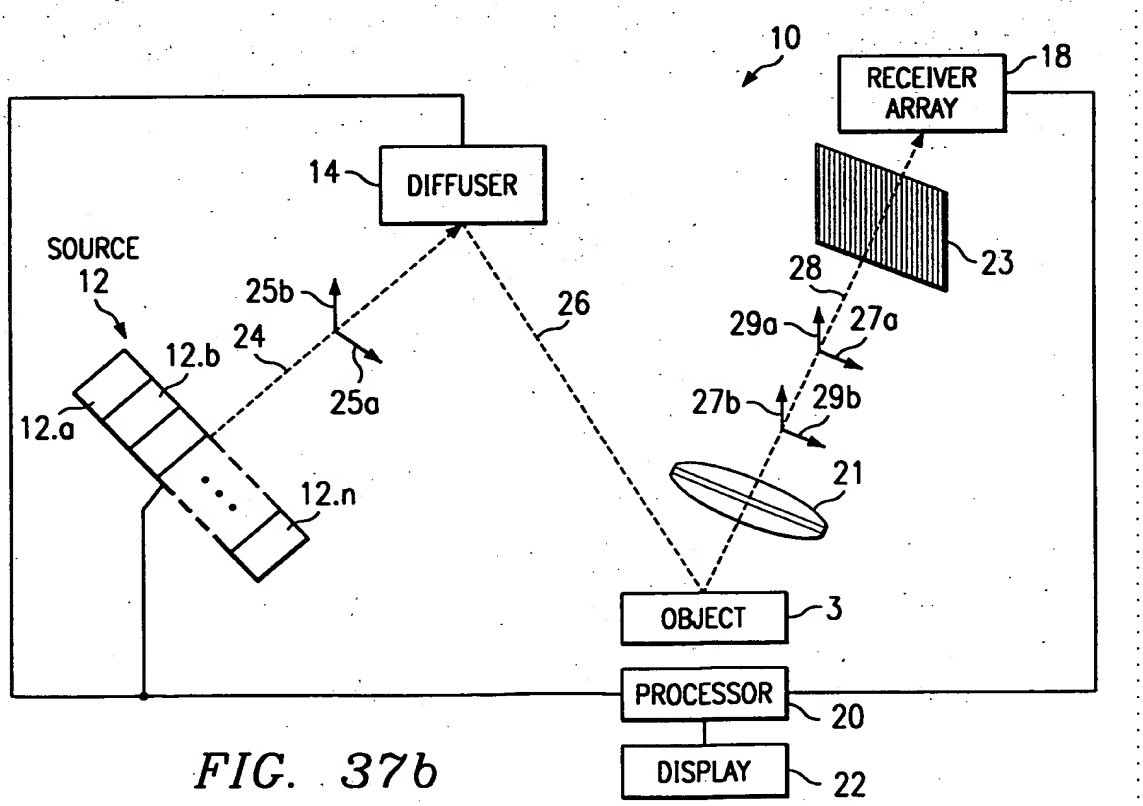


FIG. 37b

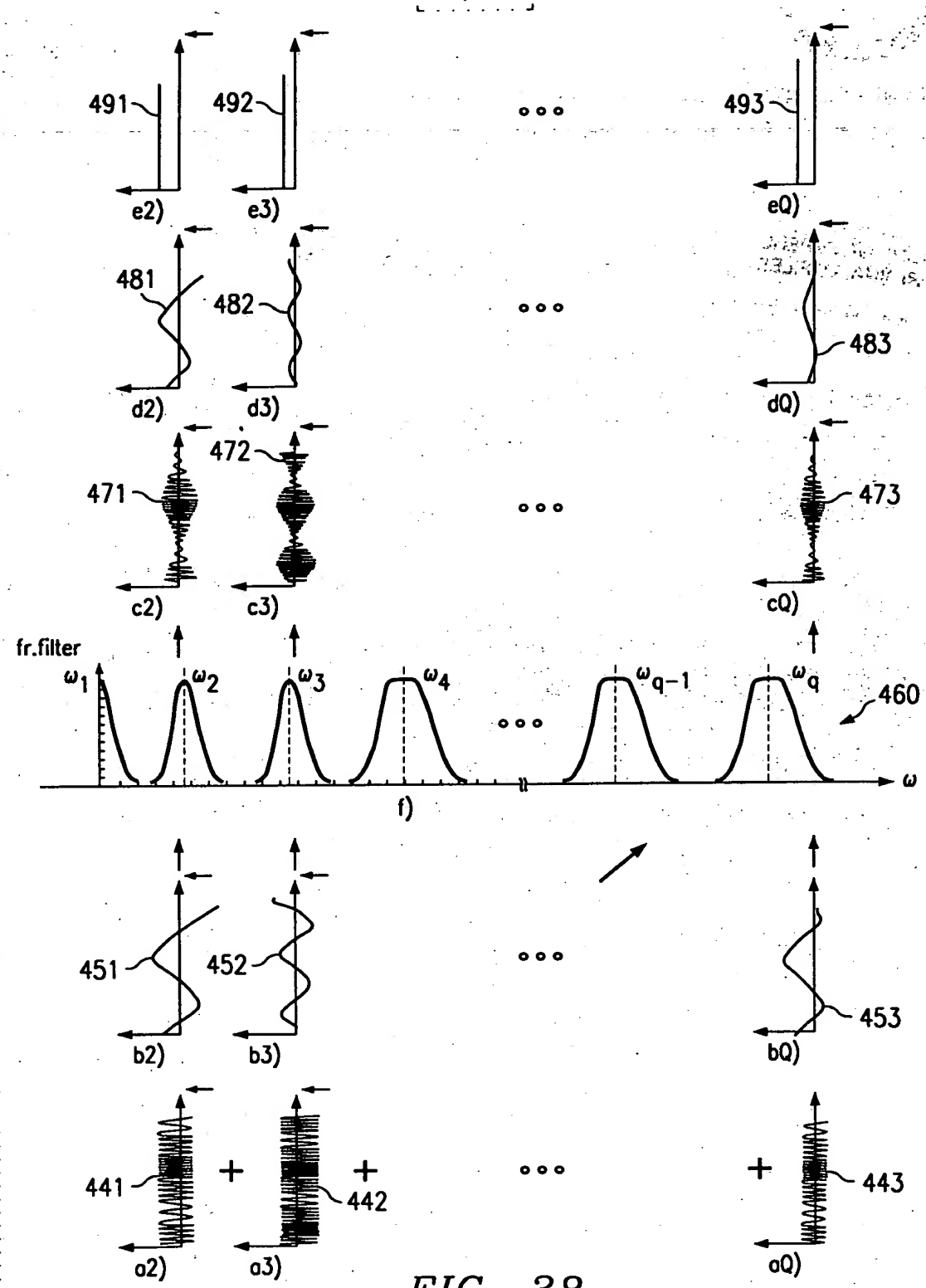

491
492
493
e2)
e3)
eQ)
481
482
483
d2)
d3)
dQ)
471
472
473
c2)
c3)
cQ)
fr.filter
ω1
ω2
ω3
ω4
ωq-1
ωq
460
ω
f)
451
452
453
b2)
b3)
bQ)
441
442
443
a2)
a3)
aQ)

FIG. 38

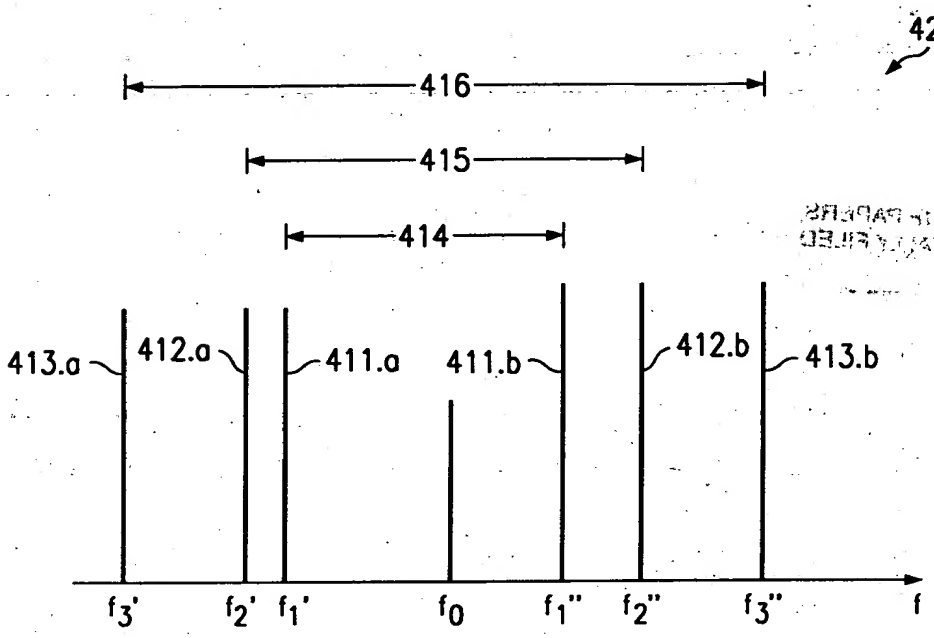


FIG. 39

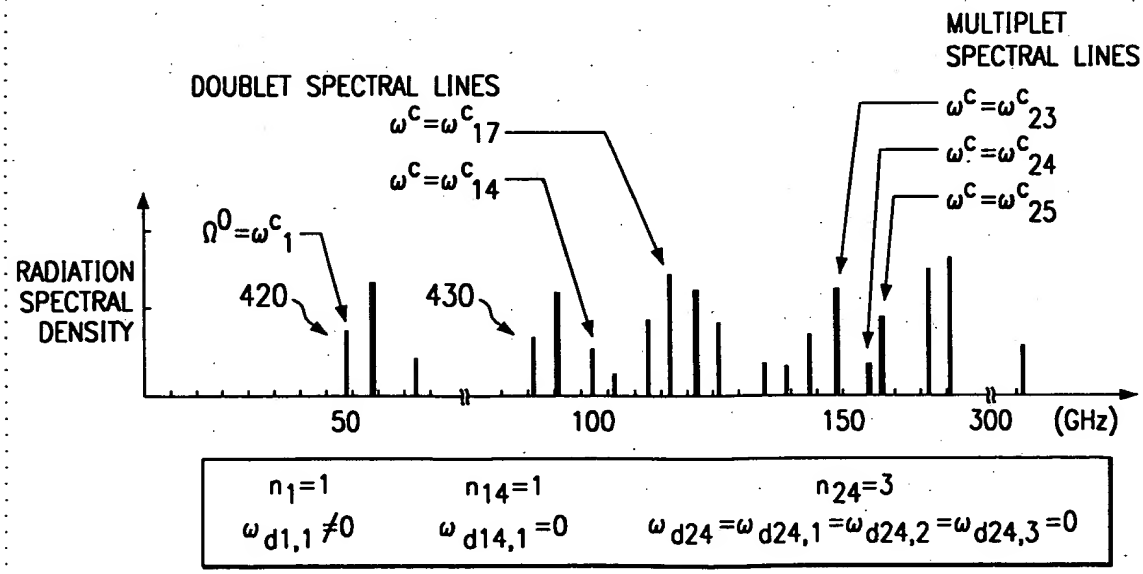


FIG. 40a

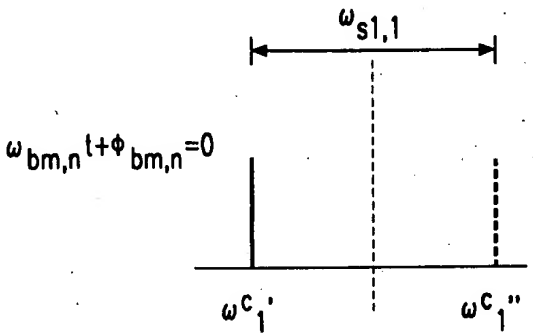


FIG. 40b

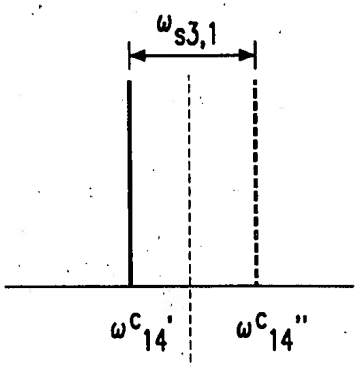


FIG. 40d

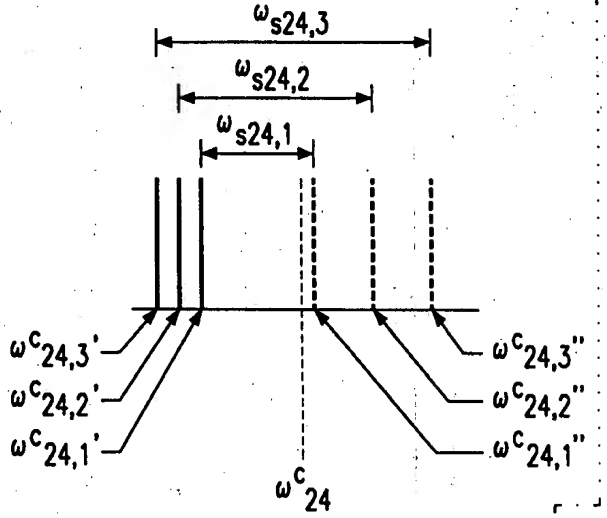


FIG. 40f

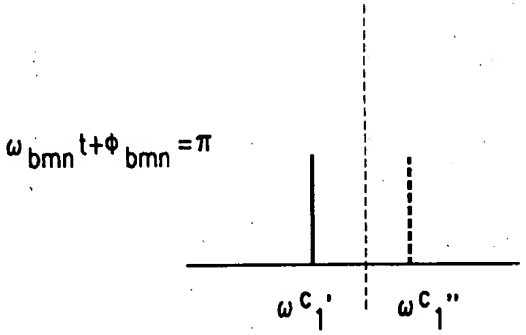


FIG. 40c

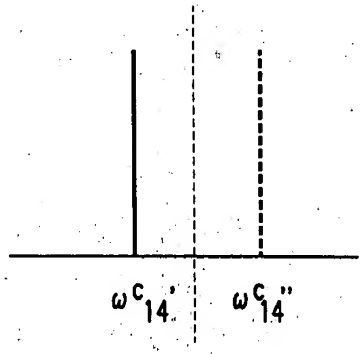


FIG. 40e

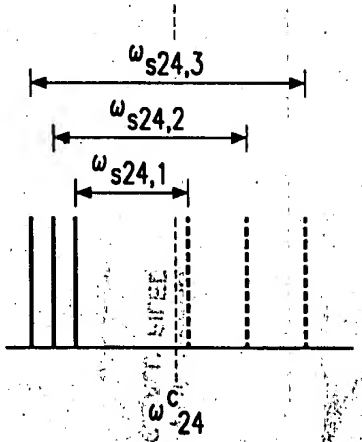


FIG. 40g

$$\omega_{bm,n}=\omega^c_{m,n}''-\omega^c_{m,n}'=\omega_{sm,n}+\omega_{dm,n}\cos(\omega_{m,n}t+\phi_{m,n})$$

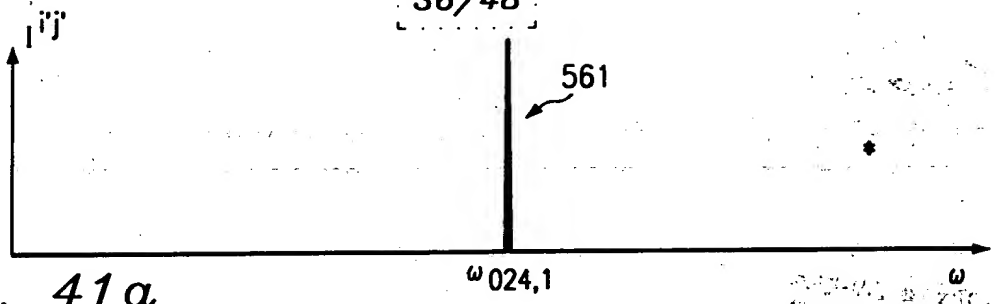


FIG. 41a

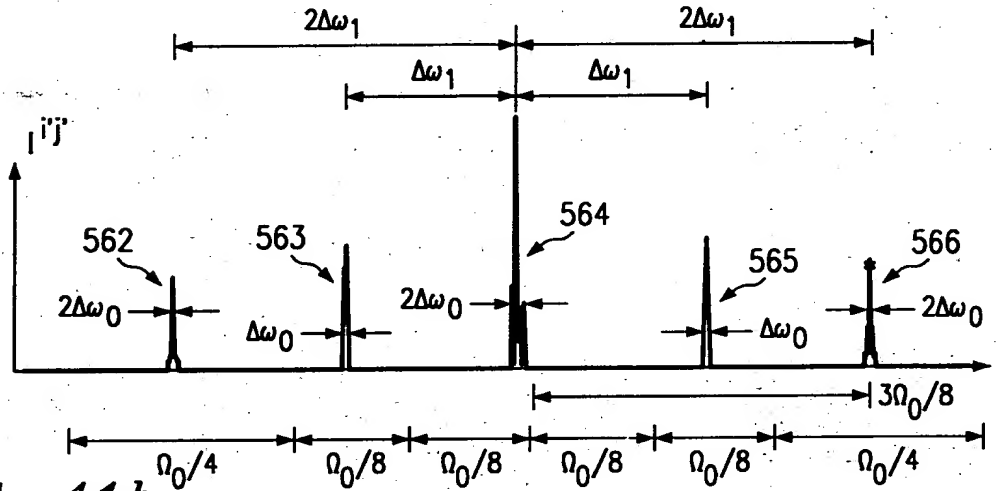


FIG. 41b

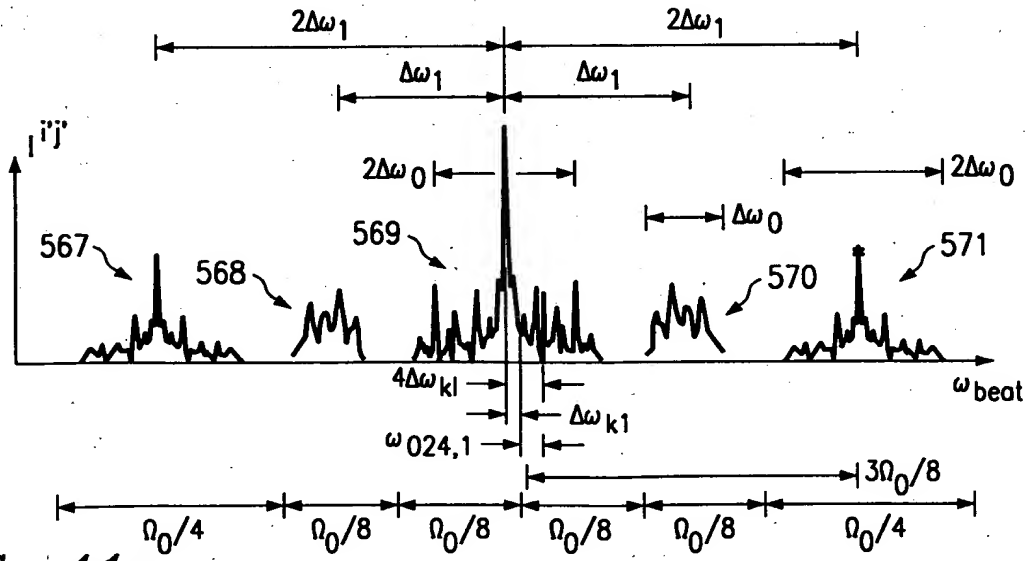


FIG. 41c

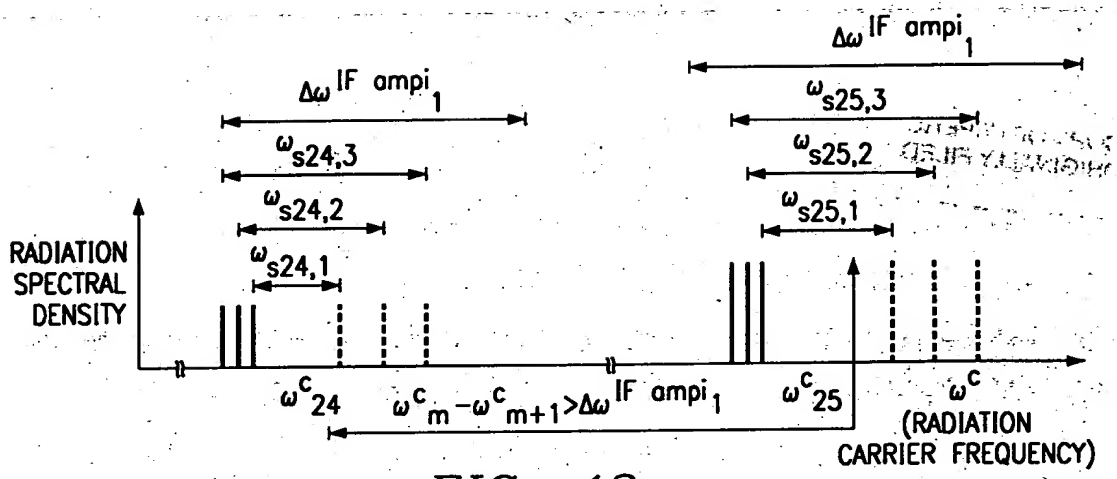


FIG. 42a

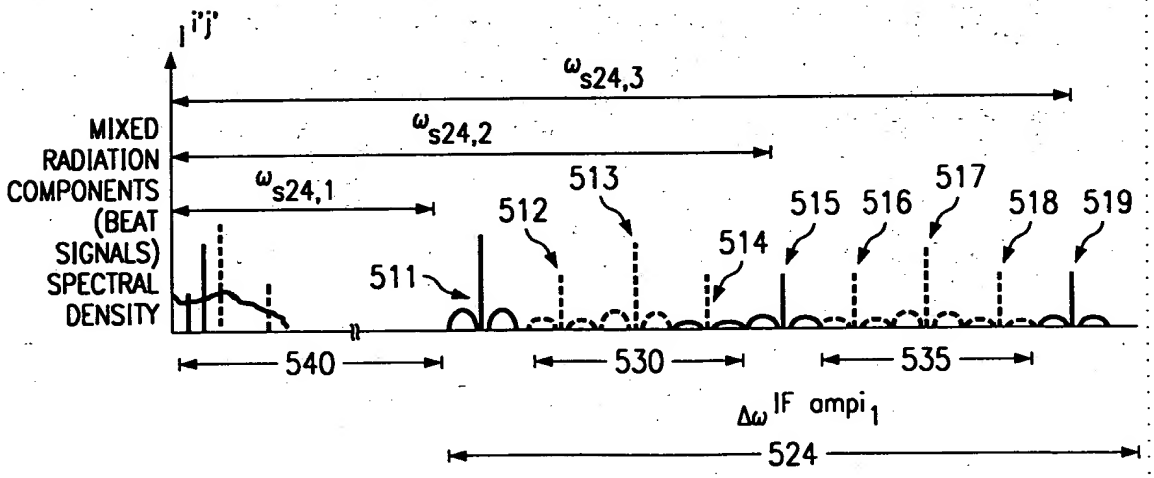
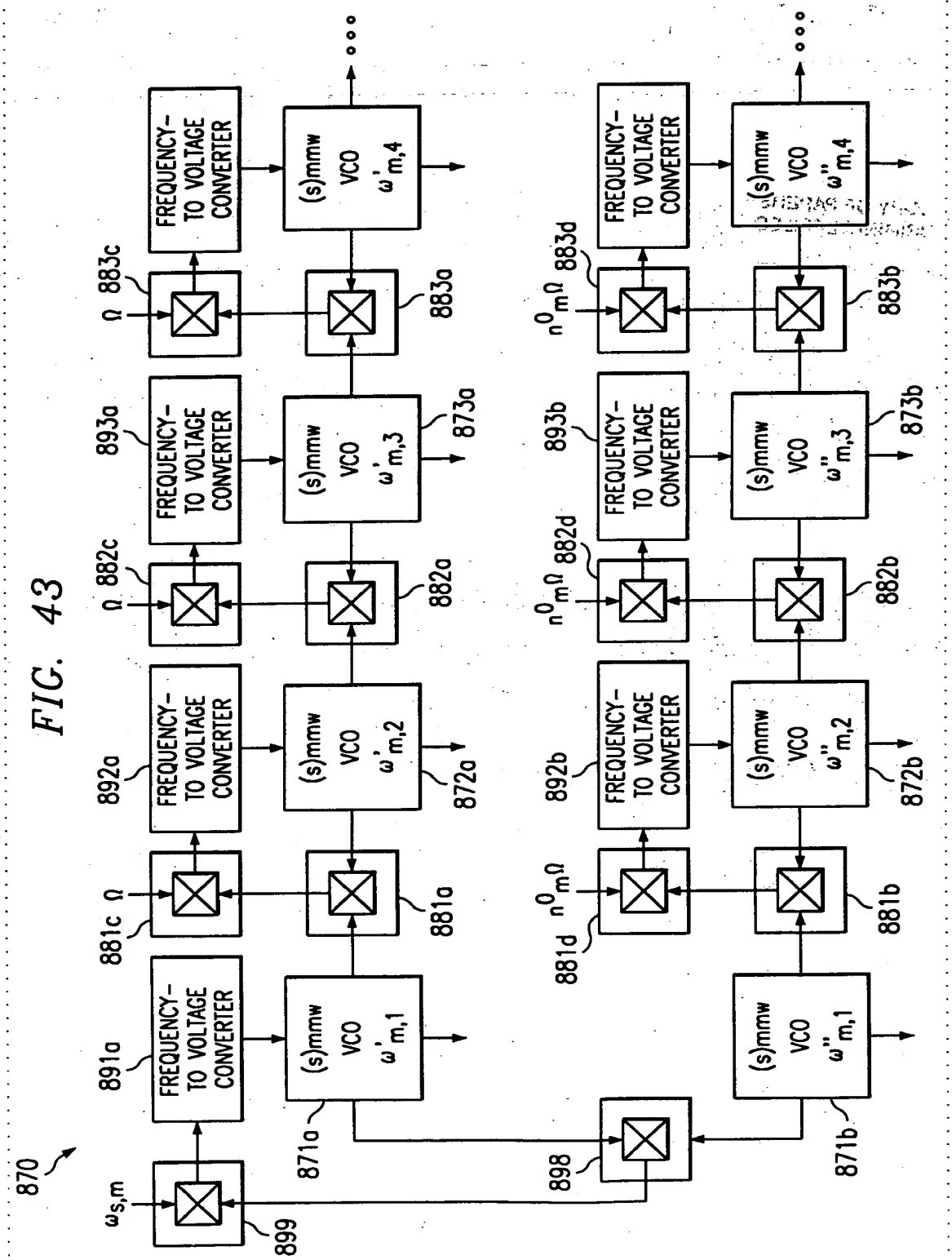


FIG. 42b

FIG. 43


870
$\omega_{s,m}$
899
891a
FREQUENCY-TO VOLTAGE CONVERTER
(s)mmw VCO $\omega'_{m,1}$
871a
881c Ω
881a
892a
FREQUENCY-TO VOLTAGE CONVERTER
(s)mmw VCO $\omega'_{m,2}$
872a
Ω 882c
882a
893a
FREQUENCY-TO VOLTAGE CONVERTER
(s)mmw VCO $\omega'_{m,3}$
873a
Ω 883c
883a
FREQUENCY-TO VOLTAGE CONVERTER
(s)mmw VCO $\omega'_{m,4}$
898
$n^0{}_m\Omega$ 881d
881b
892b
FREQUENCY-TO VOLTAGE CONVERTER
(s)mmw VCO $\omega''_{m,2}$
872b
$n^0{}_m\Omega$ 882d
882b
893b
FREQUENCY-TO VOLTAGE CONVERTER
(s)mmw VCO $\omega''_{m,3}$
873b
$n^0{}_m\Omega$ 883d
883b
FREQUENCY-TO VOLTAGE CONVERTER
(s)mmw VCO $\omega''_{m,4}$
871b

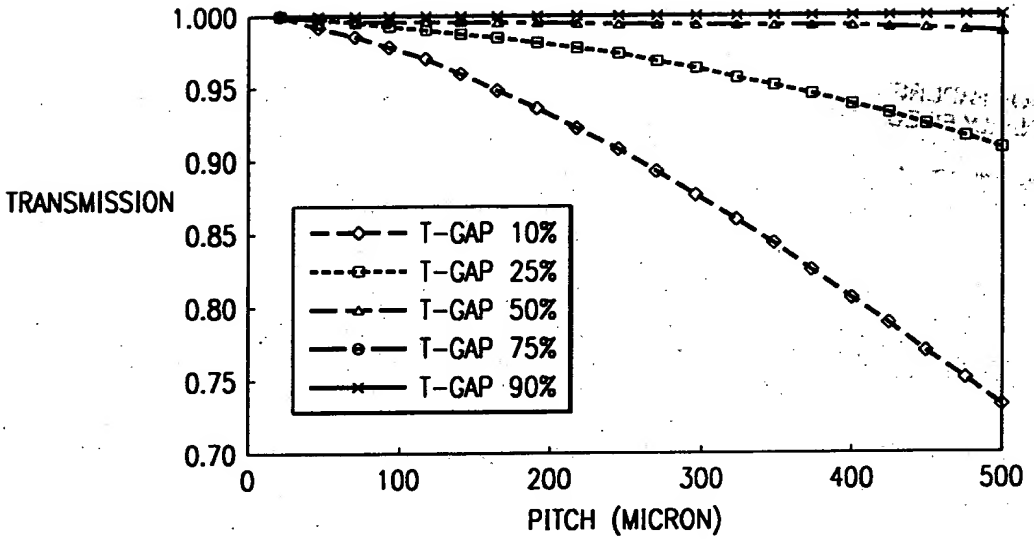


FIG. 45a

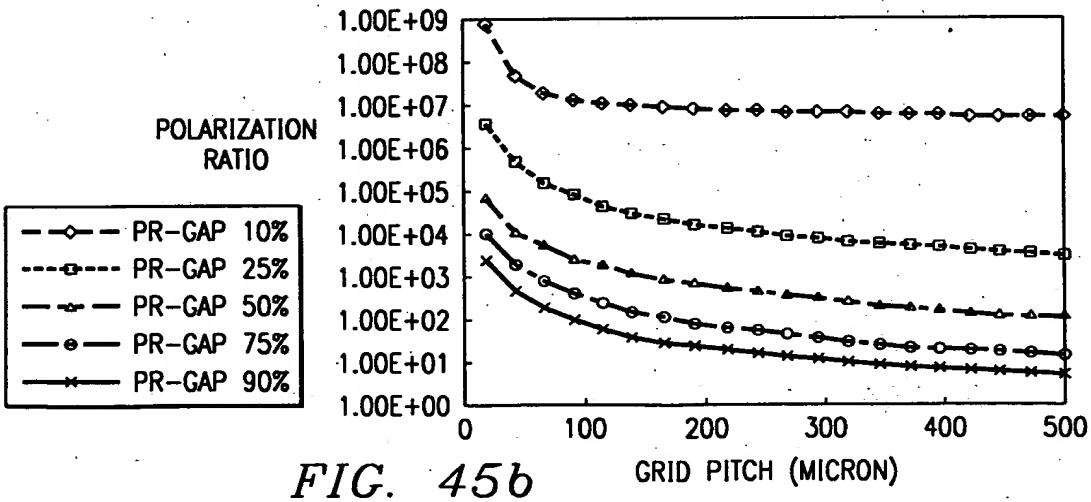


FIG. 45b

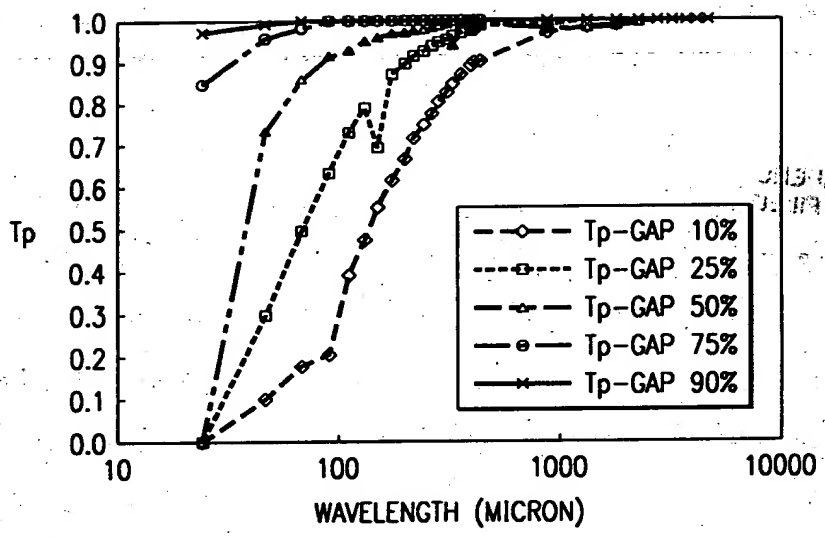


FIG. 46a

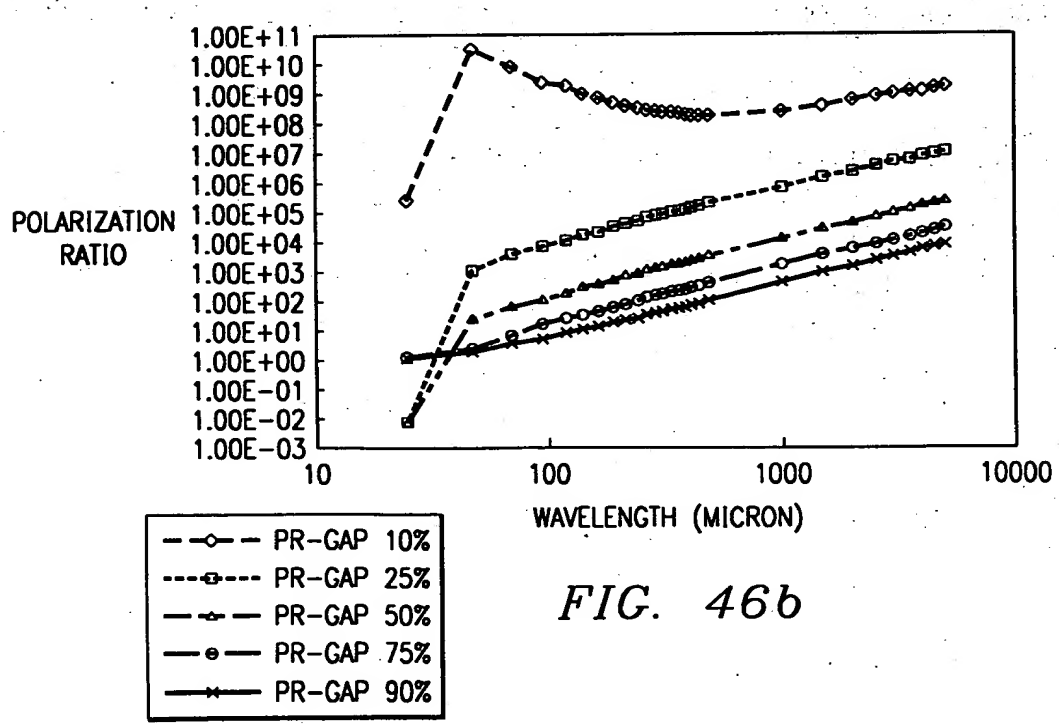


FIG. 46b

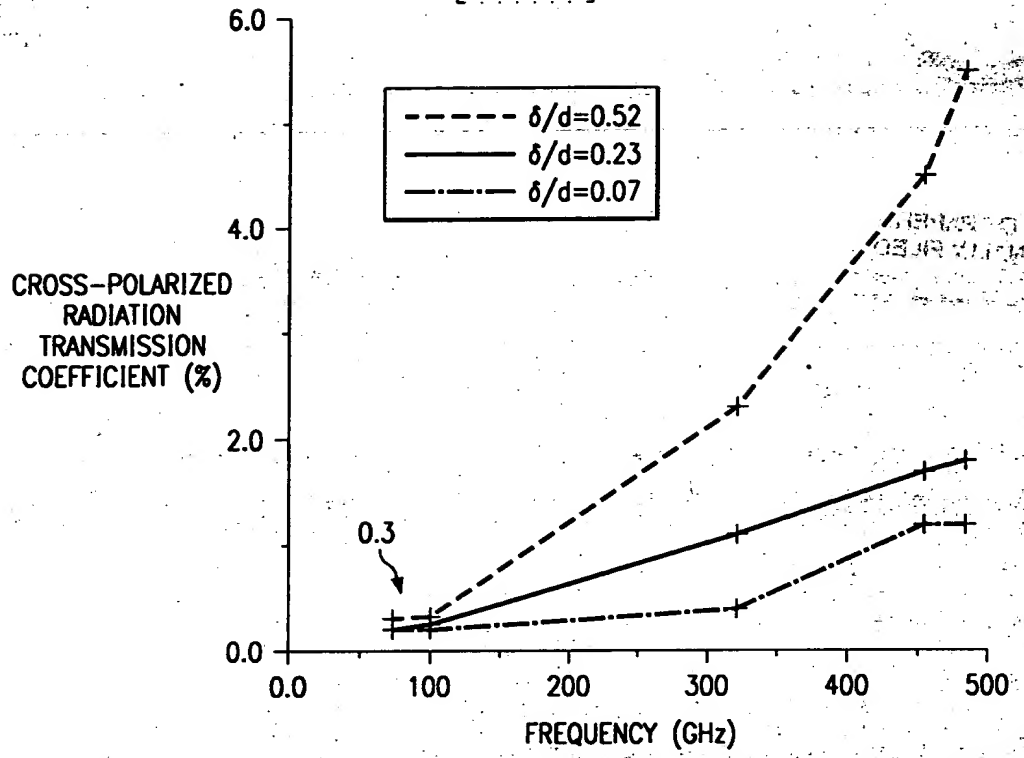


FIG. 47

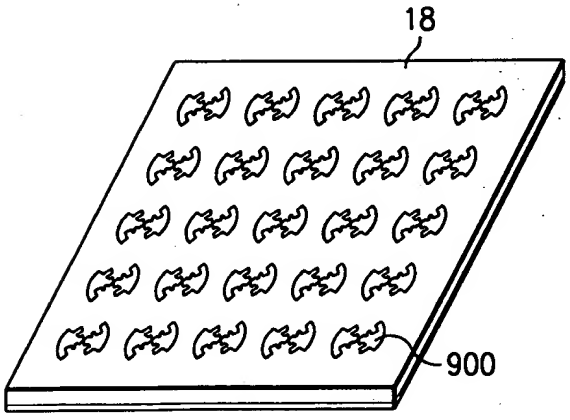


FIG. 48a

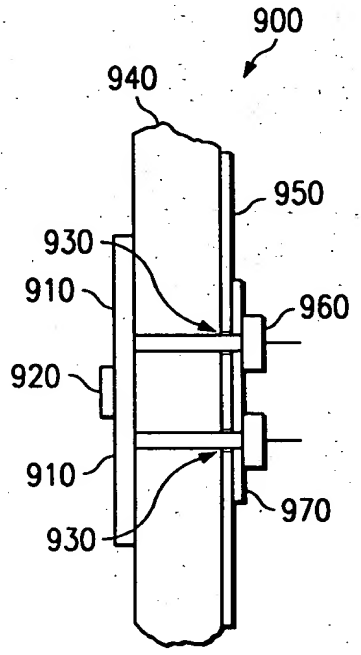


FIG. 48b

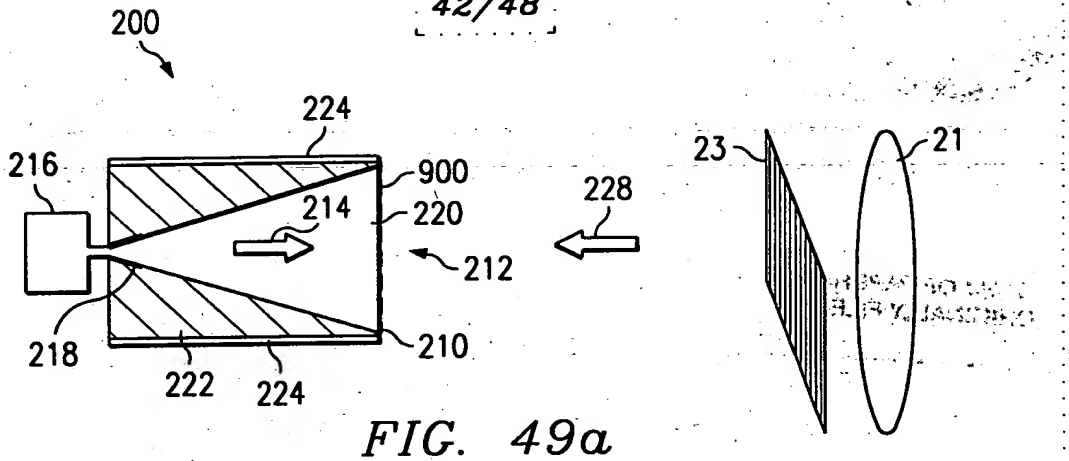


FIG. 49a

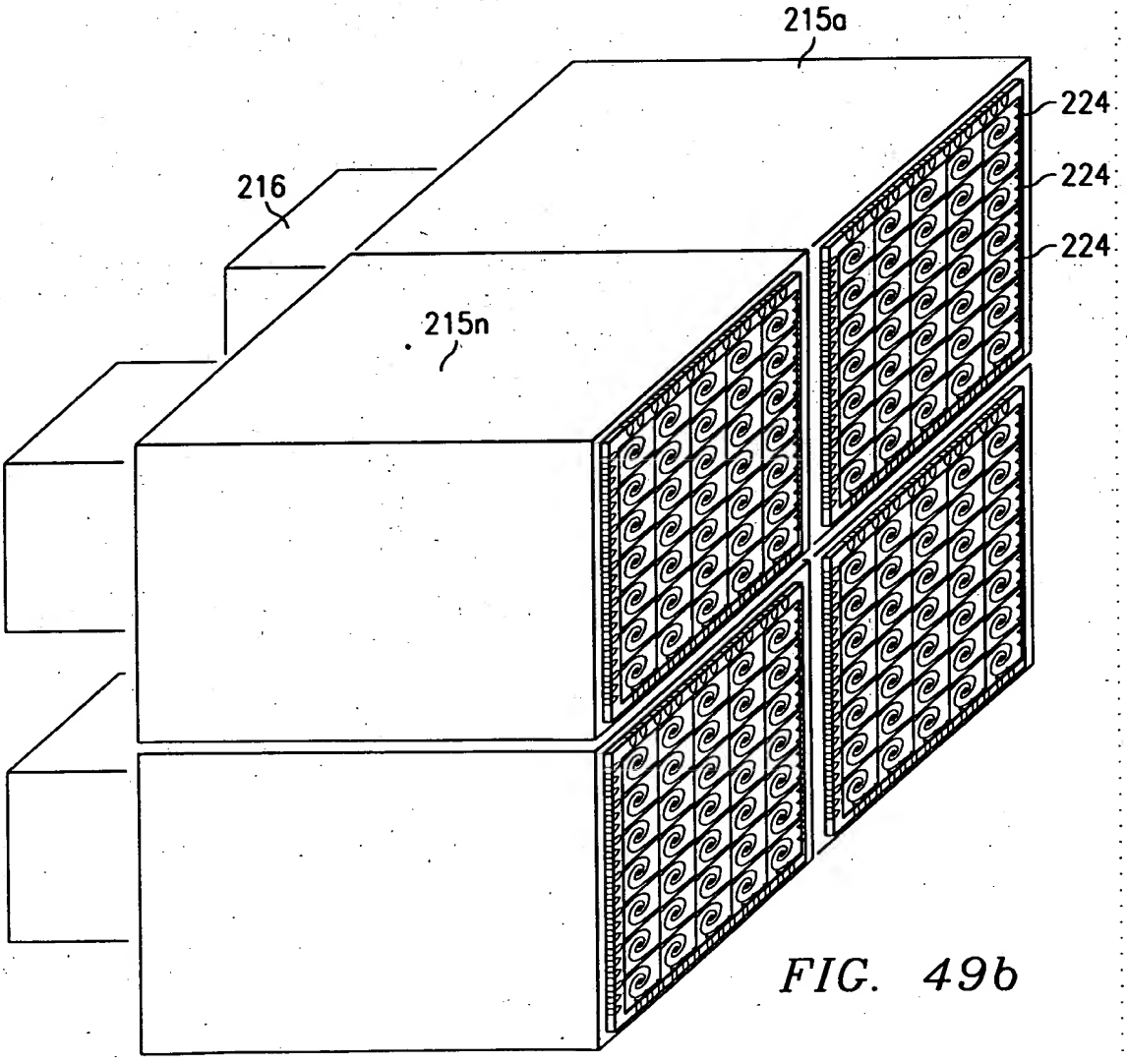


FIG. 49b

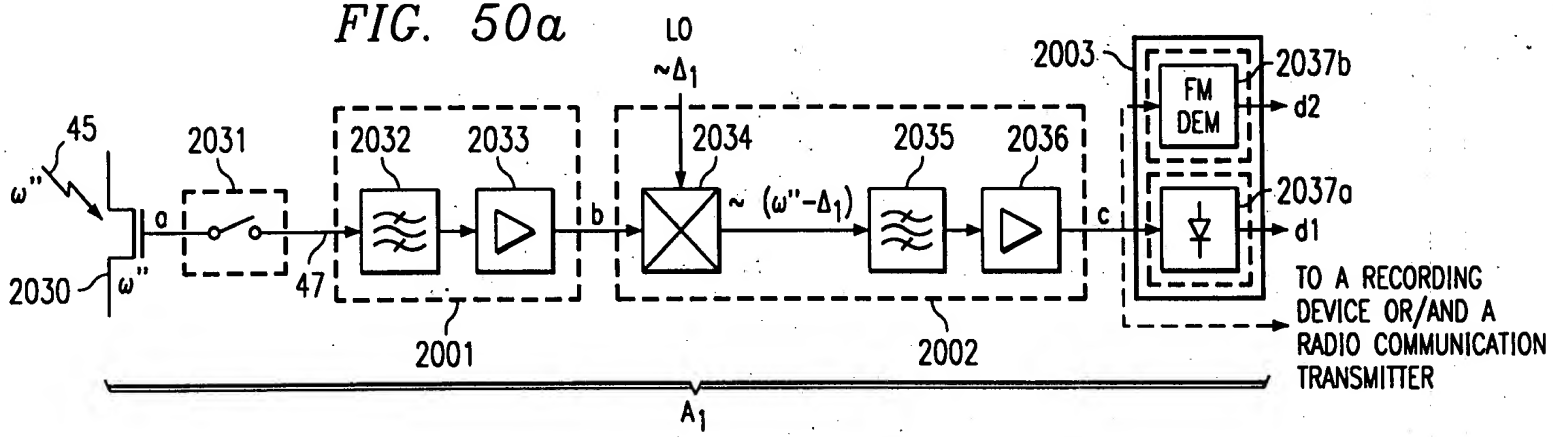


FIG. 50a

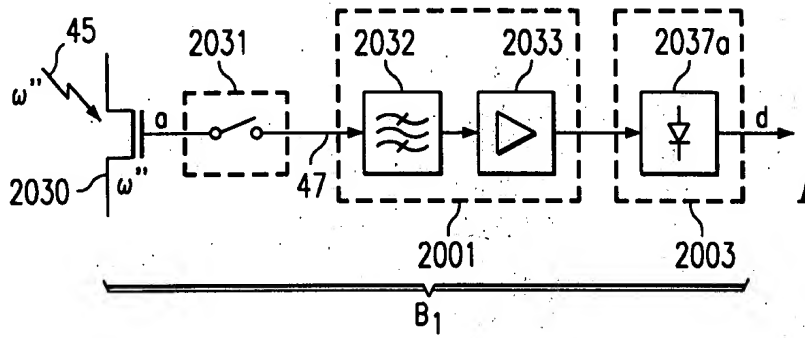


FIG. 50b

ROS8009

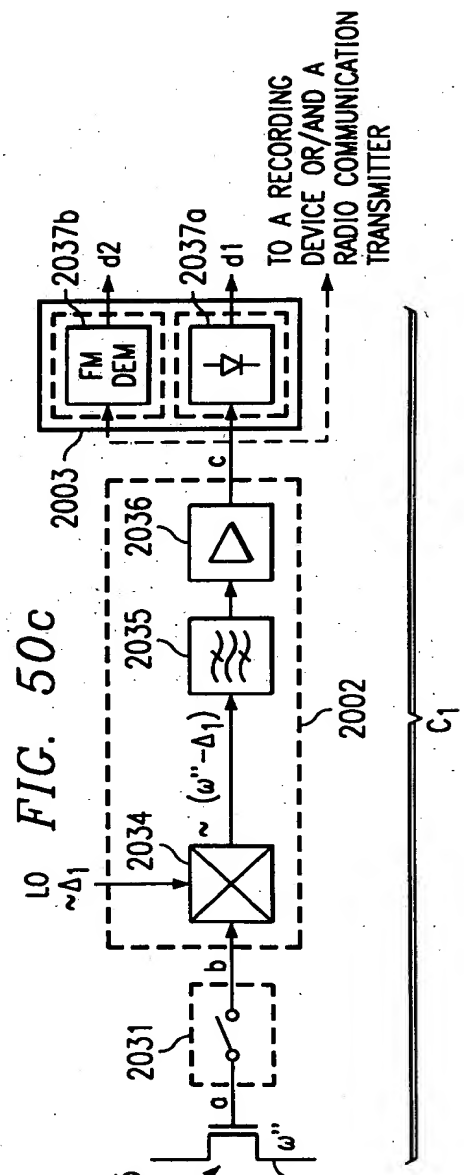


FIG. 50c

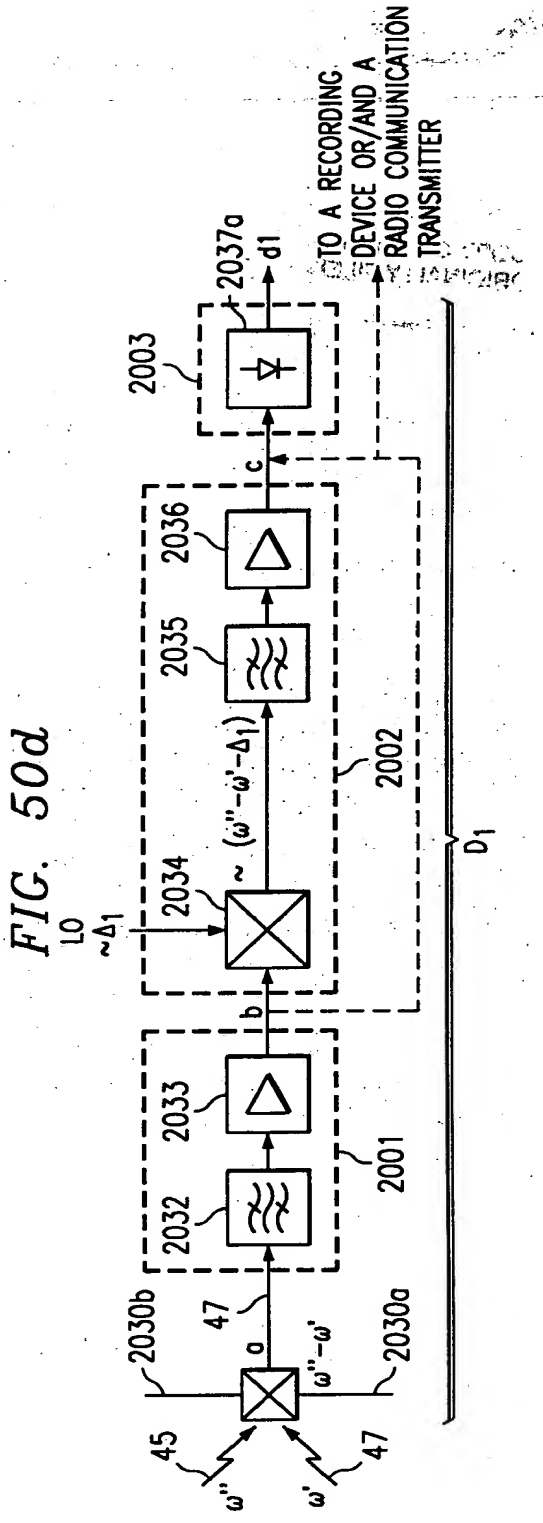


FIG. 50d

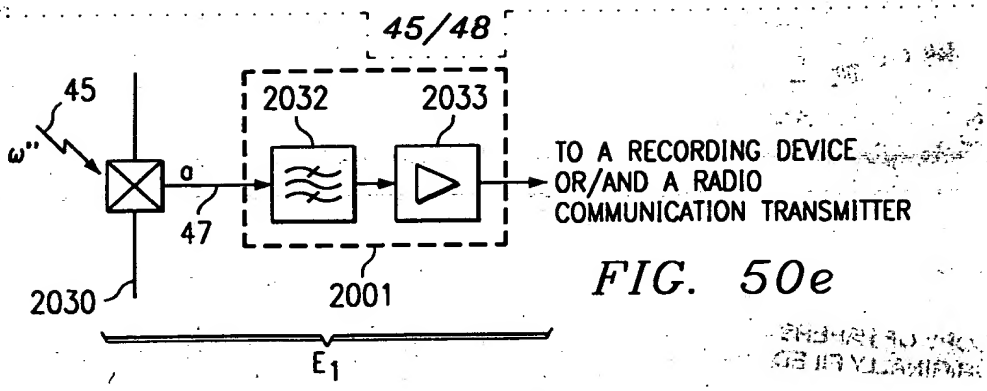


FIG. 50e

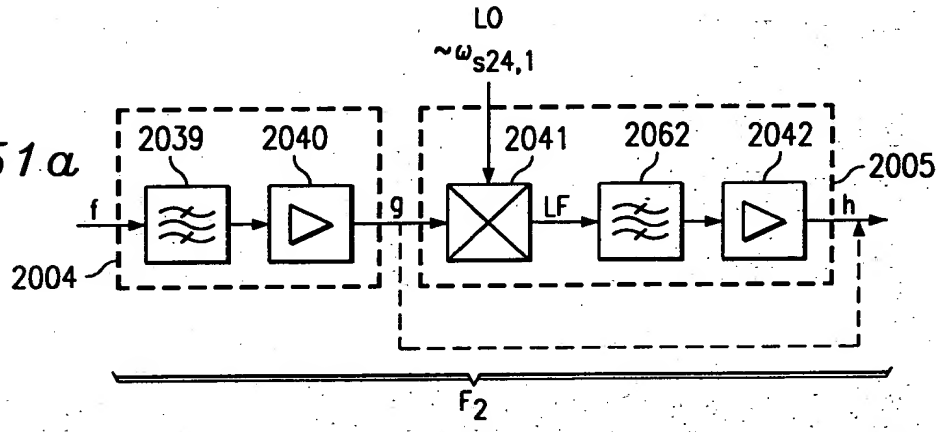


FIG. 51a

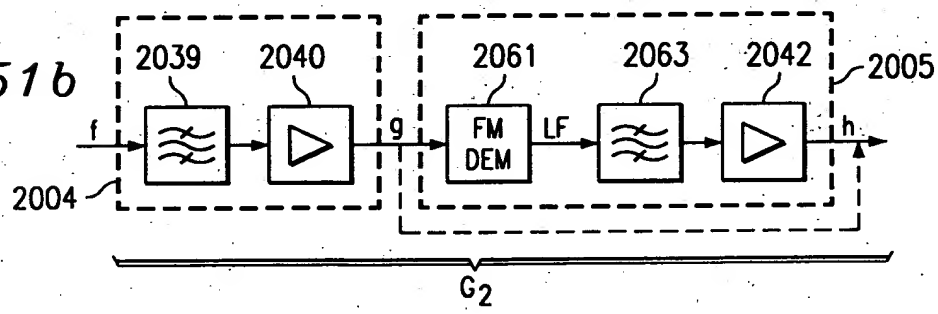


FIG. 51b

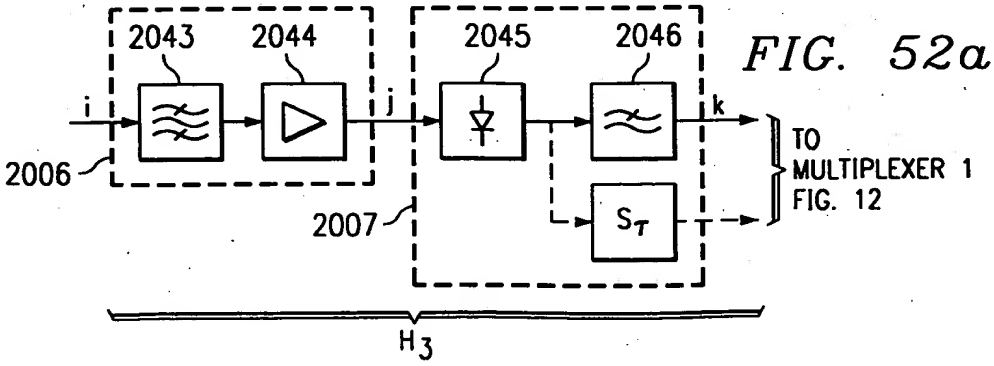


FIG. 52a

FIG. 52b

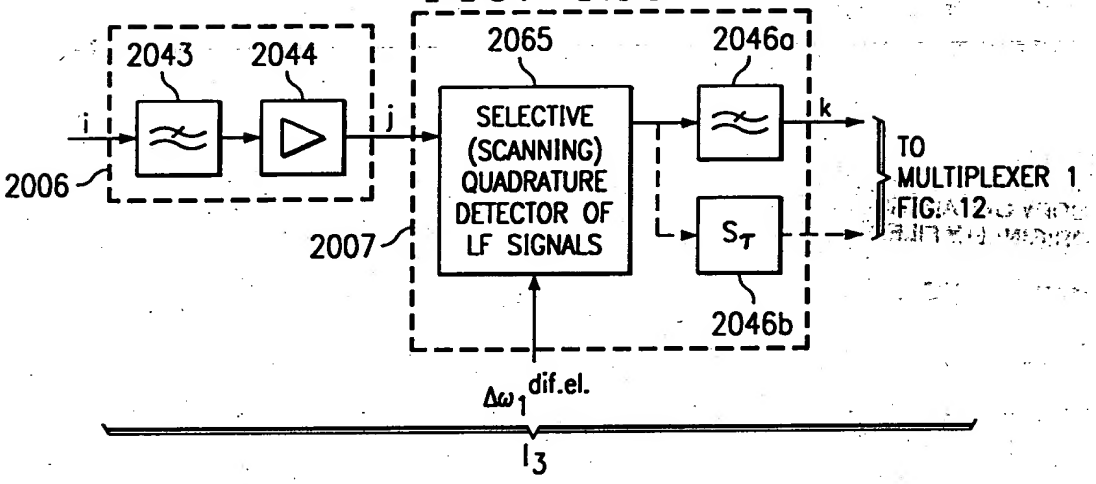


FIG. 52c

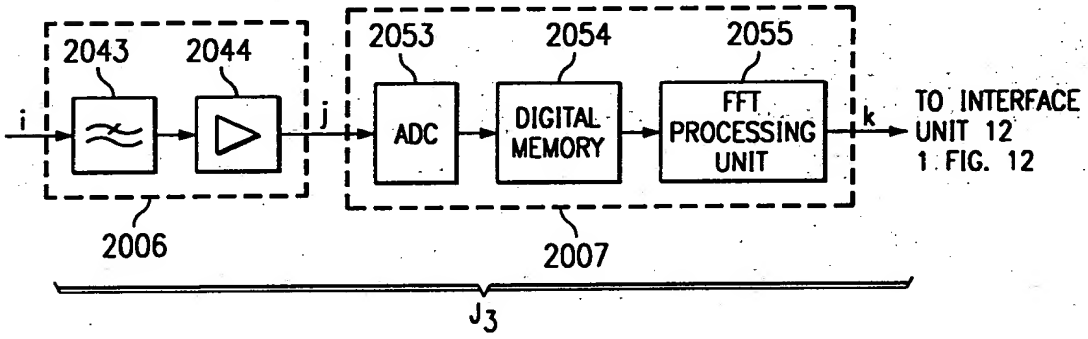


FIG. 53a

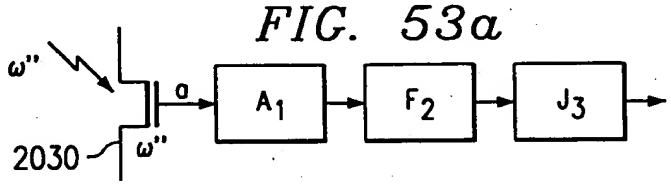
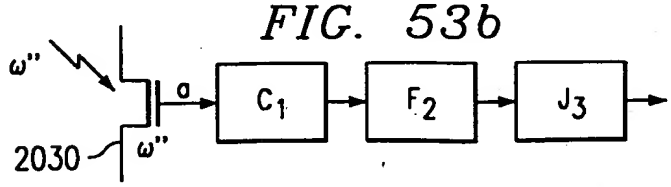


FIG. 53b



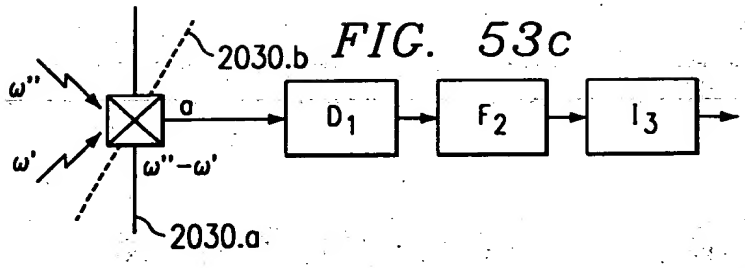


FIG. 53c

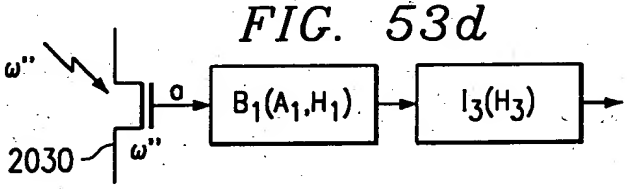


FIG. 53d

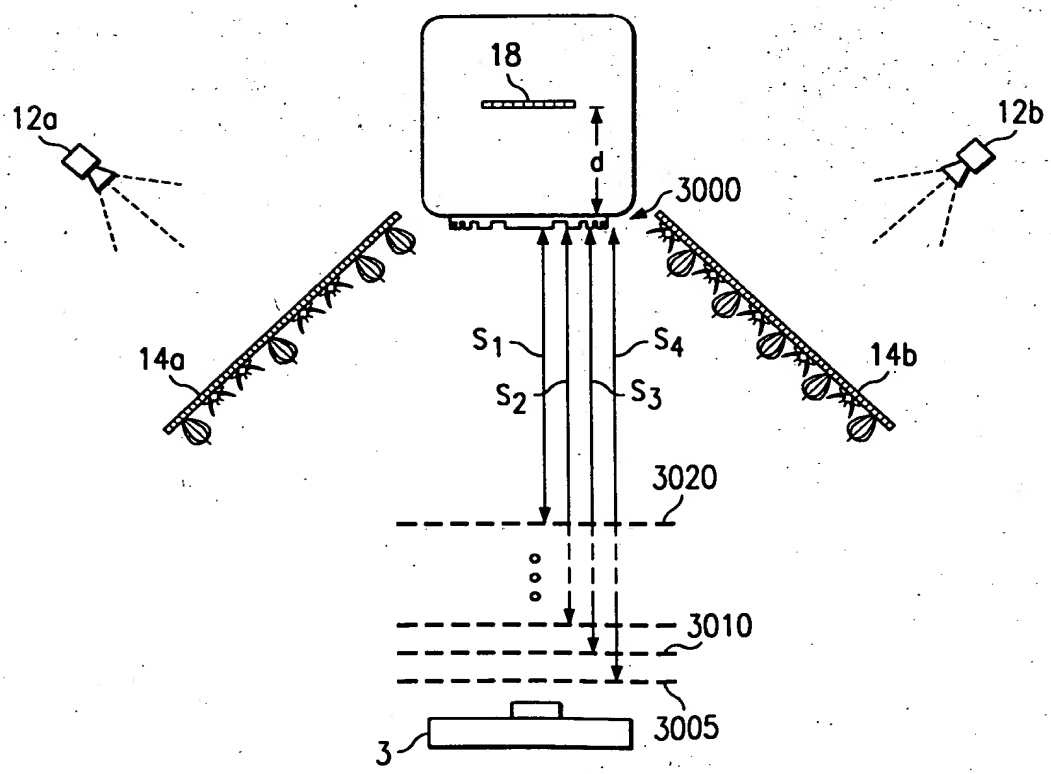


FIG. 54

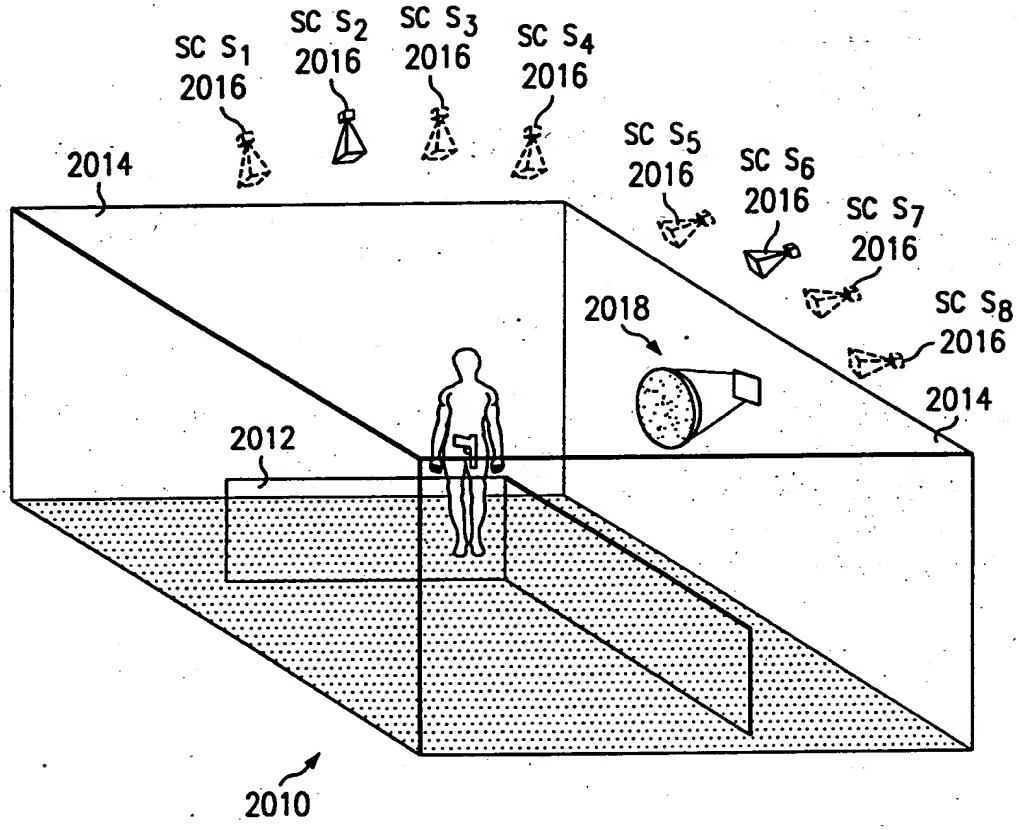

SC S1 2016
SC S2 2016
SC S3 2016
SC S4 2016
SC S5 2016
SC S6 2016
SC S7 2016
SC S8 2016
2014
2018
2014
2012
2010

FIG. 55